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Establishing knowledge network for rural regional development

----through cases in China and Japan

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Abstract

Regional disparity has become a major problem after decades of globalization and modernization in both China and Japan. Governments are emphasizing developing rural areas (Japan: depopulation region) to decrease the economic gap they have with major urban centers.

Knowledge and innovation are regarded as the engine to speed up the development of the regional economy. Regional cluster is seen as a prerequisite for the emergence of a regional innovation system. However, in many rural areas, a regional innovation system can not form due to lack of relevant regional actors (i.e. organizational “thinness”). Moreover, it costs a long time to form the regional industry cluster. This research focuses on how to develop the economy of rural areas even the condition is not sufficient to constitute the industry cluster.

Through fours cases in Japan and China in a comparative viewpoint, this thesis attempted to identify a sustainable approach and attain some empirical enlightenment to establish the knowledge network for rural areas. The factors for success in these cases were analyzed, and some implications and insights were clarified: Local specialties including both of the exogenous factors (local resource; local leadership; joint-vision; local knowledge) and endogenous factors (government function, external spillover) should be taken into account, and adopting a suitable strategy and establishing autonomy for the local people, forming the collaboration network based on the joint-vision of all the local people to exert/create (existent /new) knowledge, promoting the interaction relations to intensify the connection in the network is a realistic and effective approach to developing the socio-economy of regional areas and to narrowing the disparity. During this development, a wise leader or a team of leaders is essential, and this leader (s) also should have open communication with the local community.

In addition, the comparative analysis between Chinese and Japanese cases was done in the

viewpoint of organization structure and stage of development.

This research also put forward proposition for future research. The quantitative evaluation system for the rural knowledge network is expected to build based on the qualitative case study of this research.

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Chapter 1 Introduction

1.1 Research background introduction

During decades of globalization and modernization, population, employment and economic capacity keep concentrating in and around large urban centers. As Ohmae [1] described, the world, economically and in management terms, has become a network of prosperous city-regions. This trend spells the demise of peripheral locations, especially the rural areas with the inherent geographic disadvantage. They will find themselves exporting people, brains, investment and other forms of capital to attractive metropolitan zones or their immediate suburbs. Employment opportunities will fall; actual entrepreneurs will move away; young and educated people will relocate. A decreasing population reduces the political clout of the rural areas which the availability of national investment to public infrastructure (as in roads, health care, education) also declines. Farmers living in the rural areas (except those in the comparatively advantageous locations) could only be able to survive on increasing subsidies and protection, while suffering from the gradual decline in their wages and incomes. This dynamic appears irreversible [2]. Are therefore rural areas meant to suffer, sooner or later, a hemorrhage of human and other economic resources? This situation is undesirable, and probably unsustainable.

Regional disparity represents an ever-present development challenge in most countries [3] Needless to say, from the viewpoint of domestic and international economic policy, also for the sake of a balanced growth in both rural and urban areas, the revitalization of rural areas is of great importance not only for developing countries but also for developed countries, because not only in developing countries but also in many developed countries, rural areas face formidable challenges to economic prosperity in an increasingly knowledge-based economy. Generally,

rural areas produce goods that are vulnerable to changing export conditions. The traditional sources of rural economic competitiveness such as access to natural resources and relatively lower costs are encountering declining transportation costs and market globalization. Disadvantages of both geographic (inability to achieve equivalent economies of scale and specialized division of labor) and structural natures (migration from rural communities) help to explain the underperformance of rural economies relative to urban ones [4].

Rural areas, of course, are not entirely populated by full-time farmers. Yet, given that most people in rural areas are directly or indirectly connected to the agriculture or local-resource-based activities there, and given that the majority of the poor in the developing world reside in rural areas, the revitalization of agriculture and related activities is essential for invigoration of rural economies [5].

The challenge to economists and policy-maker is to find remedies that will decrease the gap by raising the growth rates of rural areas. Useful prescription and effective implantation depend on accurate diagnosis.

1.1.1 Introduction of the urban-rural disparity of China

The regional disparity of China originated from the socialist initial industrialization stage. The government first encouraged some specific east seacoast urban districts by economical de-regulation by “open policy” in 1980s to induce FDI (Foreign Direct Investment) and recently focused on encouraging western rural areas to reduce the huge unbalance of economy between both sides. However, the tremendous disparity between western and eastern or between urban and rural has already emerged as a most serious social problem [6]. In the eastern and coastal region, most of the provinces and municipalities, no matter per capita urban disposable income, or per capita rural net income, are by far higher than these in the western area which had the highest concentration of rural poverty, and the disparity has been widening

over time [7].The severity of disparity is alarming.

According to the recent census in 2005, till 1st November in 2005, the national population reached 1.30628 billion. The urban population was 561.57 million, 42.99% of the total population; the village population was 744.71 million, accounting for 57.01%. Comparing with the fifth national census in 2000, the proportion of urban population increased by 6.77%[1]. The urban–rural income disparity in China has also widened compared with the situation in 1978. As shown in Fig1-1, urban disposable per capita income was 2.57 of rural per capita net income in 1978, was 2.79 times in 2000, and 3.22 times in 2005, in 2007, it got the historical highest record 3.33.

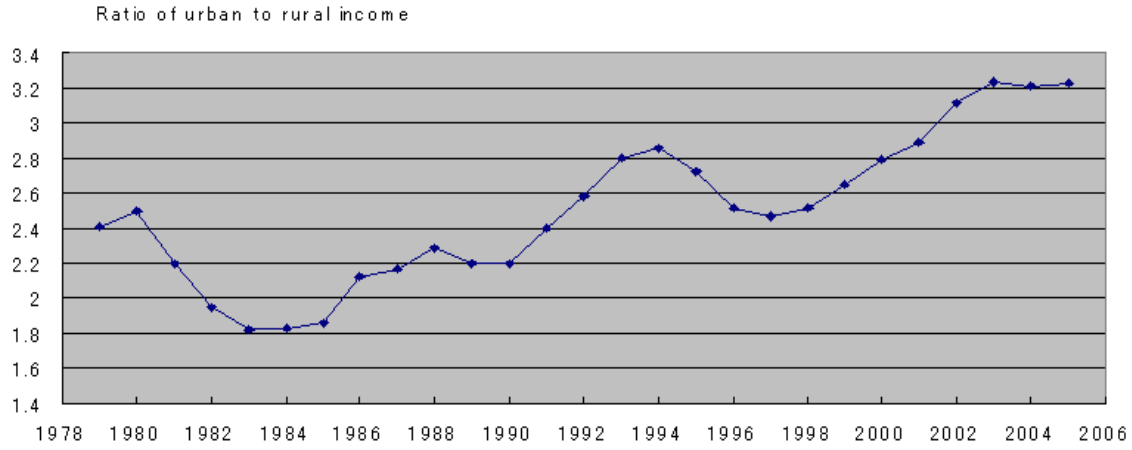

Fig 1-1 Comparison of urban and rural per capita incomes
(Urban disposable income per capita/ per capita rural net income)[2]

One phenomenon is worthy paying attention, in terms of the relatively contribution for the disparity of urban and rural, as Table 1-1 shows, the contribution ratio of disparity between rural-urban in western and middle area is much higher than that of eastern area, especially, in western China, the disparity between rural and urban contributed 58% to individual income

[1]Source: National Bureau of Statistics of China, national 1% population sample investigation main data bulletin in 2005.

[2]Source: Internet bulletins of National Bureau of Statistics of China (http://www.stats.gov.cn/tjgb/) and author's calculation

disparity. It also indicates the individual income disparity in China mostly comes from the rural-urban disparity [8].

Table 1-1 The rough calculation of the Theil index and Contribution ratio of eastern, middle, western area to the national income gap in 2002

Area	Index	Urban interior	Rural interior	Between urban and rural
Eastern area	Theil index(α=0)	0.073	0.134	0.121
	Contribution ratio (%)	22.2	40.9	36.9
	Rate of change to 1995	97	-46	14
Middle area	Theil index(α=0)	0.057	0.092	0.142
	Contribution ratio (%)	19.6	31.5	48.8
	Rate of change to 1995	84	-7	35
Western area	Theil index(α=0)	0.051	0.112	0.227
	Contribution ratio (%)	13.0	28.7	58.3
	Rate of change to 1995	65	14	15

Sources: Research result of China academy of social sciences [8]

China has large rural areas with huge population. Obviously, agriculture is of great importance to the national economy. In 1978, agriculture accounted for 28.1 percent of the Gross Domestic Production (GDP) and absorbed 70.5 percent of the national total employees. By the year 2003, agriculture - primary industry - still contributed 14.8 percent to the GDP and employed some 43 percent of the total labors in China. Farmers and rural areas have played an increasingly important role in promoting the growth of the national economy. It is estimated when the Chinese farmers contribute 100 billion RMB of final consumption, they would generate more than 230 billion RMB of consumer demand, leading to over 120 billion RMB of expanded intermediate input in the industrial sector. From every single percentage point of growth in farmers' income, the GDP would increase by 0.5 percentage point. Now the rural development have become more and more prominent, playing an increasingly important role in ensuring effective supply of farm produce as well as quality and safety, stabilizing prices, protecting eco-environment, and realizing sustainable development. Whereas, the disparity

between urban and rural, the laggard development of rural areas restricts its promotion function to the national economy, and create a direct threat to the social and political stability and, thus, the sustainability of development in China if it could not alleviate. Therefore, a large number of researchers focus on the rural development in China [9] [10] [11] [12]. At the same time, the Premier Wen Jiabao put forward establishing harmonic society. He accentuated solving the issues concerning agriculture, farmer and rural area (So called Sannong problem[3] in China) as the main missions of the central government. (Two conferences in 2005) [4].

In the long term observation of the Chinese rural development process, the disparity was caused historically, not only because of the unbalanced favored policy after open policy reform. The Chinese rural development history could be divided into five phases roughly after the establishment of PRC, each phase has it own outstanding characteristic[5].

1) Agrarian Reform (1949 to 1952)

Agriculture and rural economic in PR China has been built on top of a very weak economic base with very backward productive forces.

From 1949 to 1952, the early years following the founding of PR China, the Chinese government gave top priority to the agrarian reform for the purpose of boosting agricultural production. On June 30th, 1950, Law on Agrarian Reform of the People's Republic of China was promulgated and was warmly welcomed by emancipated farmers. During the agrarian reform, the government abolished the land ownership featuring feudalistic exploitation by the very few previous landowners and replaced it with farmers' land ownership system. This is to

[3] Sannong problem**,** refers to three issues relating to rural development in mainland China. Specifically, these issues are agriculture, rural areas and peasants. The Three Rural Issues were highlighted by Hu Jintao and Wen Jiabao as areas of rural development in China that need work. At the 2006 National People's Congress, the Three Rural Issues were especially emphasized throughout Wen Jiabao's speech on the working of the government in 2005 and the direction of the government for the year 2006.

[4] Two conferences: National Committee of the Chinese People's Political Consultative Conference (CPPCC) National People's Congress (NPC)

[5] The data partly is from Department of International Cooperation of the Ministry of Agriculture, the People's Republic of China http://www.cafte.gov.cn/english/

make sure that all farmers could have their own land, emancipate rural productive forces and boost agricultural development.

Three years of agrarian reform had greatly stimulated the farmers' production enthusiasm and triggered rapid agricultural growth. In 1952, the total agricultural output value reached 46.1 billion RMB, up by 48.5% over that of 1949; total grain output reached 163.9 million tons, up by 45%; the output of other farm produce also surpassed the highest level ever scored before the establishment of PR China.

2) Agricultural Cooperation (1953 to 1957)

Poverty was the one of the major problems in rural China in 1950s. To help the farmers shed off poverty, the Chinese government started the socialist transformation of agriculture to guide the farmers onto the road of cooperation.

The movement of agricultural cooperation in China launched in 1953 has undergone several stages, including the agricultural production mutual-aid teams, elementary agricultural producers' cooperatives and advanced agricultural producers' cooperatives.

Meanwhile the state monopolized the purchasing and marketing of farm produce like grain, cotton and oilseeds and established supply and marketing cooperatives and credit cooperative across the country.

From 1953 to 1957, China's agricultural production grew very fast with total agricultural output value increasing annually by 4.5%, grain out put by 19% and farmers' income by 5.4%.

3) 1958-1978 People’s commune period

Before 1978, China adopted a system of the people’s commune in rural areas. Under this system, land was owned by the collective ownership, production activities were carried out collectively by all commune members, farm produce purchased and sold in the framework of the government monopoly system, and profits distributed among all commune members

according to the amount of work. Such a system severely restrained farmers' initiatives, leading to slow development of agriculture, poverty and backward in rural areas for a long time.

Following the agricultural cooperation, in 1958, China began to build the people's commune featured a three-level system of ownership with the production team as the basic form and the integration of government administration with commune management. 20 years of people's commune was a time when China's agriculture experienced many ups and downs. It can be divided into three stages:

(1) The Great Leap Forward in 1958-1960 when policy errors plus serous natural disasters led to severe setback in agricultural production. The total agricultural output value in 1960 dropped by 23.1% and grain production decreased by 51.5 million tons compared with 1958, resulting in three years of difficult times for the Chinese national economy.

(2) The readjustment stage in 1961-1965 when the government adopted the principle of "readjustment, consolidation, supplementation and improvement" to restore the Chinese national economy. As a result, agricultural production was quickly restored and developed. The output of grain, cotton and oilseeds in 1965 increased by 36%, 98% and 87% respectively compared with 1960 and all rural undertakings experienced growth.

(3) The Cultural Revolution during 1966-1976 when class struggle was taken as the key and free market, private plot, enterprises responsible for their own profit or loss and output quota contracting were strongly condemned, resulting in stagnation of agriculture and rural economic development.

During these 10 years, although the state provided great financial and material support to agriculture and the farmers were working very hard, the grain and oilseed output in 1976 increased by only 3.6% and 0.9% compared with 1965, the cotton output even experienced negative growth and other farm produce witnessed very slow output growth.

In a summary, the reason which caused these 20 years' stagnation in the rural areas is the lack of basic autonomy of farmers. From production plan, production tool, to products, even their own labors were controlled by People's commune. Farmers had no autonomy, even no freedom.

4) 1978-2008

Following the Third Plenary Session of the Eleven Communist Party of China in 1978, the Chinese government adopted the policy of reform and opening up. Decision of the Central Committee of Communist Party of China on Some Questions Concerning the Acceleration of Agricultural Development was adopted on the Third Plenary Session of the Eleven CPC Central Committee. The grand rural and agricultural reform in China commenced ever since then.

The reform covered agricultural operational system, the circulation of system of farm produce, commercialized agricultural operation, agricultural and rural economic structure, agricultural legislature and agricultural supporting system. With the above measures of reform in the past 20 years, a new institutional framework has been set up in rural China to suit the development of a socialist market economy.

Along with agricultural reform started in 1978, rural areas have put in place the household-based contract responsibility system. Thanks to the reform, the economic system in rural China has undergone profound changes in the following five aspects:

(1) Breaking through the highly-centralized system of the people's commune and implementing the household-based contract responsibility system, which has given freedom to farmers in decision making in production and management;

(2) Breaking through the monoculture structure of grain production and developing diversified economic undertakings, especially township enterprises a new force emerging all of a sudden, which has greatly vitalized the rural economy;

(3) Breaking through the state monopoly system of purchase and sales, which has resulted in a remarkably stronger role of market in regulating demand and supply of agricultural products and allocation of resources, a basically established agricultural market system and gradually developed rural markets of production factors;

(4) Breaking through the single ownership structure of the collective economy, which has led to such a structure that takes public ownership as the main element that co-exists with diversified forms of ownership;

(5) Breaking through the mandatory planning of agriculture and replacing it with indicative planning, which has changed the way that government regulated agriculture and has contributed to the preliminary shaping of macro-regulation and control system of rural economy that has made combined use of economic, legal and administrative means.

In historical perspective, the responsibility system liberated the productive forces. Farmers' living standards have been greatly improved and China's rural population has been in general moving from the subsistence phase to the phase of comfortable life.

However, the division of land into micro-plots made economies of scale difficult to realize; lack of knowledge and technology, facing to the fierce global competition after China joined WTO, most of the agriculture industry faced to high cost, high risk but low profit; and after the disappear of the people’s commune, the absence of the farmers organization, independent operation farmers are lack of collaboration, farmers’ right can not be protected and they become the weak group in the society; lack of social welfare policy, farmers’ anti nature, market disaster and disease capability is weak. Only the implementation of the household-based

contract system can not decrease the gap from urban areas. On the contrary, because the farmers were granted the right of the management of the farmlands, the phenomenon of farmland abandon is becoming more and more serious. Larger and larger number of farmers goes to the urban areas to work as temporary peasant workers.

5) From 2008 on

The villagers have sought to solve the problem by pooling land into a voluntary cooperative. Vertical integration in agricultural sector is an innovation of rural economic system. It is conductive to solving the deep-seated problems such as low efficiency, small-scale operations, fewer organized farming operations and ineffective managerial system. In recent years, vertical integration has been regarded as 'ox nose' (crucial point) for restructuring of agriculture and as a driving force to organize millions of rural households for further development. The government has strengthened administration of the vertical integration, improved the relevant institutions and prepared development plans. On the other hand, the government has promulgated relevant policies for greater support for the development of vertical integration in terms of finance, credit, tax and technological advancements. In general, the development of vertical integration in agricultural sector has a strong momentum. Some 66 000 vertically integrated agricultural organizations have been set up, which have involved in 59 million rural households or some 25 percent of the total. At the same time, various parts in the country have stepped up their efforts to develop farming operations to ensure good linkage between production and marketing. At present, contract-based farming operations have expanded from grain production to production of major cash crops, animal and aquatic products. Such type of farming operations has played an important role in guiding farmers for restructuring and in promoting increase of farmers' income.

There are various forms of vertical integration. In terms of promoters, leading enterprises in

this regard has promoted 2/3 of rural households to take part in vertically integrated operations, intermediary agencies 26 percent and wholesale markets 8 percent.

The agricultural industrialization programmer, of which contact farming is a part, has been supported and motivated by the Chinese government with the purpose of making agricultural production more profitable and competitive. Contract farming offers a means to effectively connect small-scale farmers and large-scale food processing firms. Local governments also recognized the potential of contract farming for transforming the structure of agriculture and raising farm income. Many have implemented a number of programmers and incentives, such as credit support and tax reduction for agribusinesses involved in contract farming.

1.1.2 Introduction of Japanese rural-urban disparity problem

Rapid economic growth in the 20th century was accompanied by tremendous changes in spatial structure of economical activities. Japan has excellent data and relatively uniform institutions since World War II, which allow researcher to track its spatial evolution and detail its key features today. Fujita showed how structural shifts in the national economy involved major transformations of the regional structure of economic activity in his research [13].

According to the economical performance and core-periphery structure at various scale of spatial economy, Fujita divided Japan into three macro regions by aggregating 47 prefectures:

Japanese Core (J-Core) = Tokyo and Kanagawa (the core of Tokyo MA) + Aichi (containing Nagoya MA) + Osaka and Hyogo (the core of Osaka MA)[6]

Japanese Semi-Core (J-Semi-Core) = Pacific belt zone excluding the J-Core[7]

Japanese Periphery (J-Periphery) = the rest of Japan

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6 MA: metropolitan areas. Tokyo MA: Tokyo, Kanagawa, Saitama, and Chiba prefectures; Osaka MA: Osaka, Hyogo, Kyoto and Nara prefectures; Nagoya MA: Aichi, Gifu and Mie prefectures

7 More precisely J Semi-Core consists of the following 18 prefectures: Ibaraki, Saitama, Chiba, Shizuoka, Gifu, Mie, Kyoto, Nara, Wakayama, Okayama, Hiroshima, Yamaguchi, Kagawa, Ehime, Fukuoka, Oita, Saga, Nagasaki.

Based on this classification, roughly speaking, after send World War, the Japanese economy has experienced two phases of major structural changes. Now seems to be in the midst of a third one.

(1) The first cycle (the mid 1950s to the mid 1970s): Agglomeration into the three MAs, and then the expansion to the Pacific industrial belt

The period of 1956 to 1970 was Japanese golden time when the average annual growth rate of real GNP was 9.7%. During this period of rapid economic growth, Japanese industries experienced a major shift from the primary (mainly agriculture) to the secondary (mainly manufacturing) and the tertiary (mainly service) industries. All the three MAs experienced a high rate of net migration until 1970 with the peak in the early 1960s, followed by a sharp drop because of the rising land prices and wages. Therefore, the industrial dispersion from the agglomeration core to the surrounding areas formed the "Pacific industrial belt" by the late 1960s[8]. In this cycle, the rural-urban income differential already emerged markedly. As Tabuchi demonstrated, interregional migration in Japan over this period is a consequence of the income differential. As showed in the Fig 1-2, the net migration curve and Theil's measure are roughly bell-shaped and well-synchronized, conforms well to the inverse-U hypothesis of regional development by Williamson [14].

(2) The second cycle (the mid 1970s to the mid 1990s): development of the Tokyo-monopolar regional system

During the second cycle, 'Tokyo monopole regional system' came into being in Japan over the period of the mid 1970s to the mid 1990s, because only the Tokyo MA (among the three largest MAs) exhibited the same characteristics of the positive flow of net migration curve as in the first cycle (but with a lower volume than the first). In contrast, the Nagoya MA had a nearly

8 The detail reason of the net migration see [12] Fujita (2004)

zero rate of net migration, while the Osaka MA changed to a significantly negative flow of net migration.

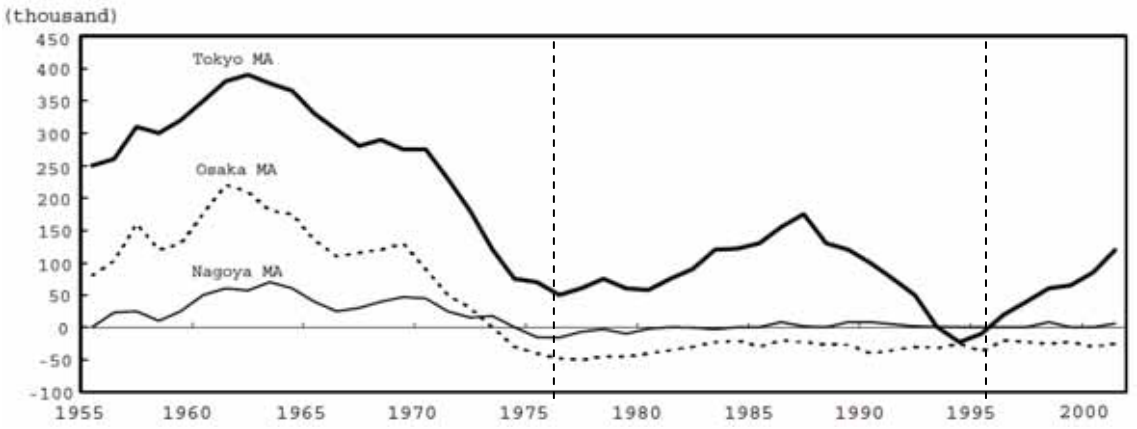


Fig 1-2 Net migration to the three largest metropolitan area

Source: from Fijita's research [13]

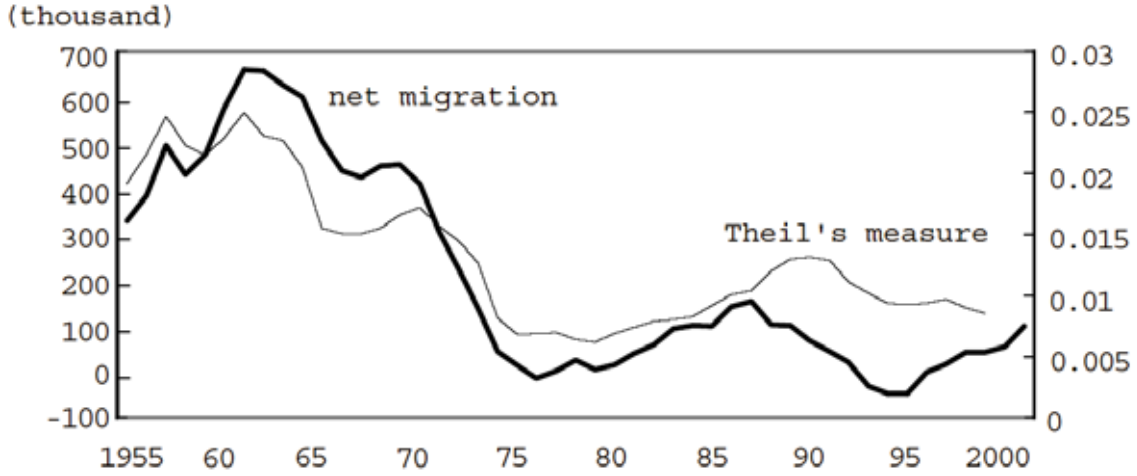


Fig 1-3 The net migration to the three largest MAs and the Theil's measure of the interregional per capita real income differential

Source: from Fijita's research [13]

In this period, the globalization of the world economy caused the successive reduction in "transport costs", which afford convenience for the large firms freely organized the location of the various units of their entire operation, encouraging the formation of multi-location or multinational firms; innovation (both products and processes) and knowledge creation (especially tacit knowledge sharing and transfer), instead of land, capital, labors, became key

competitiveness for the survival and growth of large MNFs in the information technology revolution based on the advanced telecommunications technologies. Along with other profound changes, such as the appreciation of Japanese yen, price up of oil and domestic environment problem by heavy industry, industry updating and new stable regional system was imperative under the situation. Tokyo, which had already been the biggest concentration of the knowledge-intensive industry activities, was destined to become the unparallel top-ranked city. Osaka and Nagoya demoted to second-rank cities.

Theil's measure of the interregional per capital real income differential increased in this period, indicating that the disparity between the core and peripheral regions of Japan as well as the disparity among the three MAs increased over that period [15]. The increasing disparity reflected the reality of hollow up of the peripheral areas because the dispersion of commodity-production activities from peripheral regions in Japan to the Asian developing countries, while the new knowledge-intensive activities kept concentrating into the core region of Japan(in particular into the Tokyo MA).

Good times don't last long, the continued expansion of Tokyo caused an accelerating increase in successive land-prices and soon spread to other major cities in Japan, which created huge 'bubbles' in land markets in Japan by the late 1980s. The bubble busted in the early 1990s which resulted in the prolonged recession since the early 1990s. This severe recession in the early 1990s quickly curtailed the net migration to the Tokyo MA, resulting in a first negative rate of net migration to the Tokyo MA in 1994 since 1955.

(3) The third cycle (the mid 1990s to the present): renewed trend towards the dominance of the Tokyo MA

After the so-called lost ten years of recession, it seemed like the advent of the Japanese economic resuscitation has emerged, the net migration to the Tokyo MA has been steadily

climbing up since 1996. Because during the last several years, the GDP growth rate was almost zero and even negative in 1998, but the net migration to the Tokyo MA has been growing, Fujita made a metaphor “Sinking ship syndrome” to interpret this phenomenon[9].

In a summary, Japanese regional economy developed and kept a typical Core-Periphery structure (having a semi-core region in the middle). Along with the general positive net migration, relatively high labor productivity in manufacturing, and sustainable updating to knowledge intensive industry of the MAs, other areas, especially the peripheral areas, suffered from depopulation, scarcity of young people, the disproportionate number of senior citizens, unequal access to education opportunities, hollowing-out of manufacturing and absence of service industry, and the deficiency of funds to provide needed health and social service. Moreover, the current demographic trends nationally such as declining fertility and the unprecedented rapid aging of the general population will even deteriorate the situation in the rural areas.

As a description about rural Japan by Martin Fackler in the New York Times[10], in Japan, while the big cities are flourishing, in rural parts of the country, “downtowns have emptied and factories have closed, and an exodus to Tokyo of youths seeking jobs has left behind towns that are predominantly for the elderly. There is widespread concern here that these changes are turning Japan into a nation divided into winners and losers, split geographically between prosperous cities and the depressed rural areas.” Table1-2 shows the first 5 and last 5 prefectures in average income per capita rank from 1975 to 2005.

Since 1960s, Japanese government has enacted a serial of regulations and policies which aims

[9] In view of the issue in this section is about the disparity of the rural-urban in Japan, we do not enter into details here. And as Fujita pointed out “it is too early to talk much about the third cycle”.

[10] In Japan, Rural Economies Wane as Cities Thrive Published: December 5, 2007
http://www.nytimes.com/2007/12/05/business/worldbusiness/05gap.html?pagewanted=1&_r=2&ref=business

to stimulate the development of the peripheral areas to attain the balanced development of the whole country. In 1961, Agricultural Basic Law (ABL) was enacted, the Farmland and Rural Improvement Project (FRIP) has played a critical role in the development of rural areas under the ABL. Furthermore, the FRIP consisted of the Farmland Improvement Project (FIP) mainly to improve agricultural productivity and the Rural Improvement Project (RIP) to improve living conditions as well as to prevent loss of agricultural resources. The FIP includes projects and works related to irrigation, drainage, land consolidation, land reclamation, and so on. On the other hand, the RIP includes integrated rural improvement projects, the rural sewerage projects, agricultural and rural road projects, hilly and mountainous areas development projects, and disaster prevention projects for rural areas and farmland.

These projects have improved the infrastructure for agriculture or related industries. However, the past 40 years experience showed, it can not stop the declining of rural area. Moreover, scholars doubt the agricultural subsidy policy. According to Fujita's research, Japan perhaps is the worst example among nations whose agricultural policy has almost entirely failed in adapting to the globalizing world, since the early 1960s, Japanese agriculture has been heavily protected through subsidies, tariffs and other policy measures. In particular, in terms of PSE (producer support estimate), the protection degree of Japanese major crops (rice, wheat for food, etc.) has been "extraordinarily" high either in international comparison or absolute terms [16]. Not surprisingly, such Japanese agricultural policy has heavily distorted the working of normal mechanisms in the agricultural and related markets, while impeding the modernization and adaptation of Japanese agriculture in the globalizing world.

The detailed situations are different in Japan and China, but in a sense, the basic factors which cause regional disparity and regional depopulation are globalization and harder competition in world-wide free market for both cases. As a matter of fact, from the perspective

Table 1-2 First 5 and Last 5 prefectures in average income per capita rank in Japan

Rank	1975		1980		1985		1990		1994		2000		2005	
1	Tokyo	100.	Tokyo	100.	Tokyo	100.	Tokyo	100.	Tokyo	100.	Tokyo	100.	Tokyo	100.
2	Osaka	85.5	Osaka	86.9	Aichi	80.2	Aichi	77.0	Aichi	80.5	Aichi	74.5	Aichi	73.8
3	Kanagawa	77.0	Aichi	80.8	Kanagawa	74.1	Osaka	72.9	Shiga	75.4	Kanagawa	73.1	Shizuoka	73.7
4	Aichi	75.5	Kanagawa	80.1	Osaka	73.5	Kanagawa	72.2	Osaka	74.1	Shiga	72.9	Shiga	68.5
5	Hyōgo	74.0	Tochigi	75.5	Shiga	70.8	Shiga	68.4	Kanagawa	73.8	Shizuoka	71.5	Kanagawa	67.1
43	Nagasaki	54.4	Nagasaki	56.1	Kochi	53.1	Shimane	48.0	Kochi	55.3	Aomori	51.9	Nagasaki	46.5
44	Aomori	54.2	Iwate	55.5	Miyazaki	52.9	Aomori	47.5	Miyazaki	52.6	Kagoshima	50.8	Miyazaki	46.3
45	Iwate	53.2	Kagoshima	55.2	Kagoshima	50.8	Kagoshima	47.2	Shimane	52.5	Nagasaki	50.6	Aomori	45.7
46	Okinawa	52.7	Aomori	54.2	Aomori	50.1	Kochi	46.8	Kagoshima	52.3	Miyazaki	50.3	Kochi	44.9
47	Kagoshima	51.9	Okinawa	51.3	Okinawa	49.6	Okinawa	44.8	Okinawa	48.0	Okinawa	45.2	Okinawa	42.3

The data are calculated by using Tokyo's per capita income index in the same year as the standard 100[11].

[11] Source: Author calculated according to the economic calculation report of Cabinet Office about per capita income of residents each year.

of the aging and urbanization rate, the similar tendency could be observed in both countries. As Table1-3 shows, the indices of aging, GNP per capita and urbanization rate, China (2010) will bear a close resemblance to the situation of Japan around 1972. In other words, China lags behind Japan about 30 years in the viewpoint of urbanization till now.

Fig 1-4 Trends of the regional income disparity in Japan[12]

(Average per capita income of the top five prefectures to bottom five prefectures)

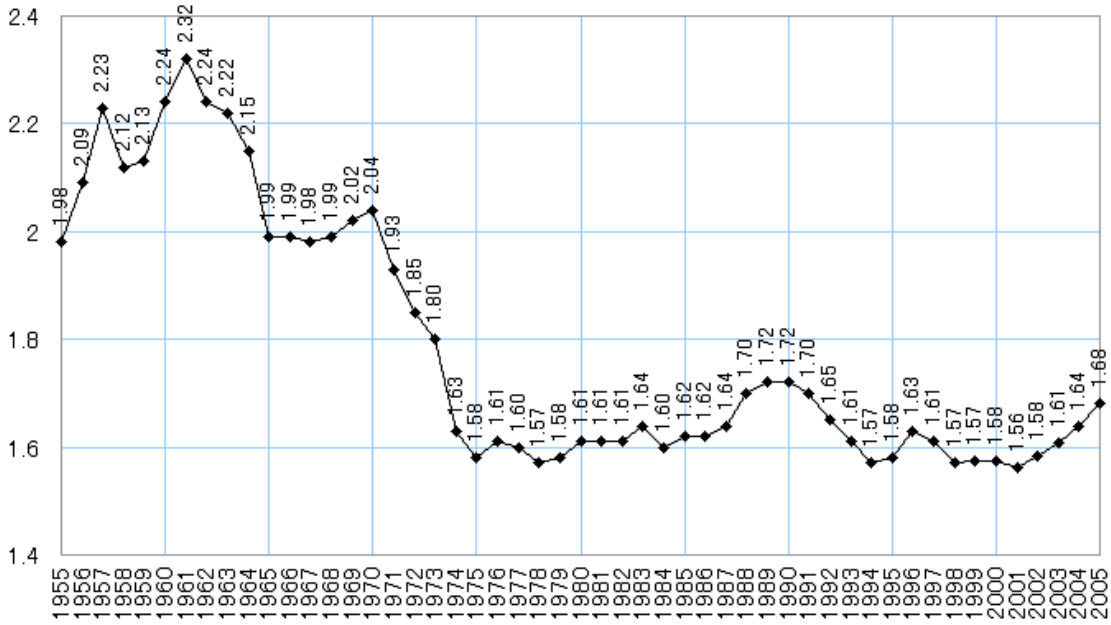


Table 1-3 Comparative indices between China and Japan

Nation	Year	GNP ($) (per capita)	Aging (%) Over 65	Urbanization Rate (%)
China	2000	840	7	36.9
China	2010	2446	8.5	About 50
Japan	1972	2540	7.1	72.1

12 The relevant Geni index: 1961:0.134; 2001:0.067;2003:0.075
Source: Honkawa data tribune Data catalog of social situation http://www2.ttcn.ne.jp/honkawa/7450.html

1.2 The purpose of research

Historically speaking, although the population share of the full-time farmers has become lower and lower in most countries, the share of the rural population continues to be significant in most countries. For the sake of a balanced and sustainable growth, for the safety and stabilization, for the antipoverty process in the developing countries, developing the rural areas remains an issue of crucial importance for both kinds of countries. Given that each rural area is unique in many aspects, such as the infrastructure, human capital, industries and son on, it would not be productive to discuss a fit-to-all general strategy for rural development.

Based on the practical situation in rural areas, the research purpose of this thesis is:

1) To discover the key factors to encourage the rural regional businesses and industries.

2) To discover what are the obstacles to develop rural regions and how to eliminate them.

Knowledge network will be one essential factor for regional development. If so,

3) To discover the mechanism for establishing it in rural regions.

1.3 The framework of thesis

The thesis is organized into the following 6 chapters. Chapter 1 introduces the research background and research purpose. The reason and process of regional disparity in both China and Japan are traced in detail. Chapter 2 provides a literature review of the knowledge-based economy, knowledge creation process, regional development theory in the history of economic thought, including cluster theory, regional innovation system theory and rural development theory. The failures of RIS approach in rural areas are specially called for attention. Chapter 3 puts forward the research questions, introduces the analysis methodology and explains specifically why these cases are selected. Chapter 4 describes the development process and determinant factors of four cases in China and Japan which attempt to explore the theoretical and practical illumination from their success. Chapter 5 presents an analysis of

external/internal factors for the knowledge network formulation, and the mechanism of knowledge network. The comparative analysis based on these cases of Japan and China is also exhibited in Chapter 5. The thesis concludes by summarizing the major findings of the discussion and pointing out some directions for future research activities.

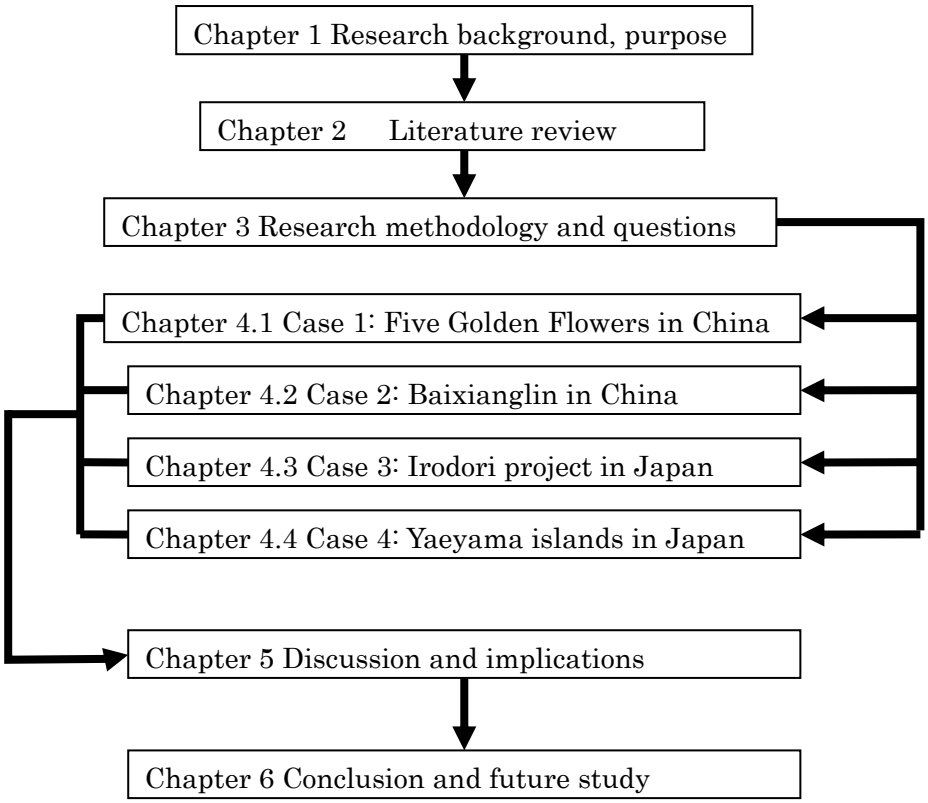


Fig 1-5 Framework of the thesis

Chapter 2 Literature review

2.1 Knowledge and innovation

2.1.1 Knowledge and innovation as the co-competence of the regions

By the second half of the 1950s, it had become increasingly clear to both policy makers and economic analysts that the continuing growth rates of western economies could no longer be explained in terms of traditional economic factors such as land, labor, and capital[17]. It had to be explained in terms of the upgrading of labor force, surplus generated by interaction effects, and more generally the role of knowledge in the economy [18]. In terms of firms, scholars have argued for a “knowledge-based view of the firm” suggesting that the key role of the firm is in creating, storing, and applying knowledge rather than simply reducing transaction costs [19][20][21][22]. A further progenitor of the view that knowledge is a most important economic resource was Penrose [23]. However, Schumpeter was the first scholar who recognized the importance of knowledge in the economy by his reference to ‘new combinations of knowledge’ at the heart of innovation and entrepreneurship [24].

Till now, a widespread agreement has been attained in academic literature that knowledge, learning and innovation are keys to economic development and competitiveness for firms, regions and nations. As Alvin Toffler said, we are now living in a `knowledge-based society', where knowledge is the source of the highest quality power[25]. In a world where markets, products, technologies, competitors, regulations and even societies change rapidly, continuous innovation and the knowledge that enables such innovation have become important sources of sustainable competitive advantage. Hence, management scholars today consider knowledge and the capability to create and utilize knowledge to be the most important source of a firm's sustainable competitive advantage.

The knowledge, as Thomas Jefferson, the third President of the United States, described: "He who

receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me." In doing so, Jefferson anticipated the modern concept that knowledge is a public good. At the present age, the internet has in practice brought knowledge access closer to the ideal of a global public good. The communication revolution has made great strides in facilitating communication within countries and has also enhanced the ability of developing and transitional countries to tap into the global pool of (codified) knowledge [26].

However, scholars have recently argued that two prerequisites for a capability to be a source of lasting competitive advantage to a region are that it cannot simply be purchased and transferred elsewhere (the question of regional specificity [27]) and cannot easily be replicated elsewhere (the question of imperfect imitation) [28] [29], because partly much technological knowledge is what Polanyi calls “tacit”, and cannot be codified [30]. In other words, regional collective learning always occurs in some particular places involving ‘the creation and further development of a base of common or shared knowledge among individuals making up a productive system’ [31]. The localized phenomena in the increasingly ‘slippery’ global economy is the ‘stickiness’ of some forms of knowledge and learning processes [32]. The ‘stickiness’ is caused by the fact that some important types of knowledge are socially embedded knowledge, of an informal, tacit nature constituted by skilled personal routines, technical practices, norms of behavior, implicit and shared beliefs and co-operative relations in organizations, firm networks and local communities, which cannot easily be isolated from the individual, social and territorial context, or codified and transferred through formal channels of information. Thus, whilst ‘information is relatively globally mobile (…) knowledge is remarkably spatially rooted’ [33]. As a consequence, adopters must spend time and other resources learning and experimenting before they can master what has been mastered elsewhere. It is also partly because of what Evenson and Westphal call “circumstantial sensitivity [34].” That is, because of differences in climate, available raw materials, skills, customs, preferences, regulations, etc., what works in one

country will often not work in another[35]. As a consequence, Economic geography in an era of global competition poses a paradox. In theory, location should no longer be a source of competitive advantage. Open global markets, rapid transportation, and high-speed communications should allow any company to source any thing from any place at any time. But in practice, location remains central to competition. Today's economic map of the world is characterized by what Porter calls clusters: critical masses in one place of linked industries and institutions--from suppliers to universities to government agencies--that enjoy unusual competitive success in a particular field. The most famous examples are found in Silicon Valley and Hollywood. Porter observes that 'paradoxically, the enduring competitive advantages in a global economy lie increasingly in local things -- knowledge, relationships, and motivation that distant rivals cannot match' [36]. The same observation was also presented in TRRA[13]: "The geography of production in the new economy is marked by a paradoxical consequence of globalization: the increasing importance of the locality as a site for innovation. The role of knowledge and creativity in this economy places a premium on the kind of localized, or regionally-based, innovation that is fostered by proximity. Innovative capabilities are frequently sustained through regional communities that share a common knowledge base and interact through common institutions. The forms of collaboration and interaction which occur in these communities draw attention to the role that regional institutions can play in supporting innovation in a global economy." As Morgan pointed out, "we are now beginning to appreciate that globalization and localization, far from being mutually exclusive processes, are actually much more interwoven than is generally acknowledged." [37] Such is the irony of globalization: it widens and integrates the market but, at the same time, innovation goes on dependent upon regions or localities which are a key and strategic factor in competition.

[13] Toronto Region Research Alliance Report **(TRRA)** was prepared by a team of researchers from the Program on Globalizaton and Regional Innovation Systems at the Munk Centre for International Studies, University of Toronto. The Program on Globalization and Regional Innovation Systems at the Centre for International Studies was established by Professors Meric S. Gertler and David A. Wolfe to study a key aspect of the emerging global economy

2.1.2 Knowledge and knowledge creation process: SECI model

This research adopts the traditional definition of knowledge as “justified true belief” and Nonaka division of knowledge, explicit and tacit knowledge. Michael Polanyi [38] pioneered the distinction between tacit (or personal) and explicit knowledge in the philosophy of science, and the distinction has since proven important to understand problems in the transfer of technologies, not to mention the "transfer" of institutions. Ryle [39] for the earlier distinction between knowing how and knowing that, Oakeshott[40] for a treatment of practical knowledge versus technical knowledge, Schön[41] 1983 for a related treatment of professional versus instrumental knowledge, and Scott[42] 1998 on metis versus episteme/techne. The tacit/codified distinction was clearly presented in Nonaka and Takeuchi’s SECI model theory, Larry Squire [43] 1987 gives a dozen labels for similar distinctions as Nonaka. It is necessary to differentiate knowledge from information. Information is defined as easily codifiable knowledge that can be transmitted ‘without loss of integrity once the syntactical rules required for deciphering it are known. Information includes facts, axiomatic propositions, and symbols’ [44]. However, know-how involves knowledge that is tacit, ‘sticky,’ complex, and difficult to codify [45][46]. The properties of know-how suggest that, compared to information, know-how is more likely to result in advantages that are sustainable [47]. Botkin and Seeley[48] addressed the importance of a “living community” for knowledge management because eighty percent of knowledge is tacit; therefore, the collaborative tendencies of communities are the only way to share knowledge. In order to maintain and create healthy communities, managers must create a vision or challenge for a community, implement a schedule or pace for interaction, and combine the right set of technology and tools and interpersonal relationships between groups.

Explicit knowledge can be expressed in formal and systematic language and shared in the form of data, scientific formulae, specifications, manuals and such like. It can be processed, transmitted and stored relatively easily. In contrast, tacit knowledge is highly personal and hard to formalize.

Subjective insights, intuitions and hunches fall into this category of knowledge. Tacit knowledge is deeply rooted in action, procedures, routines, commitment, ideals, values and emotions. It indwells in a comprehensive cognizance of the human mind and body. It is difficult to communicate tacit knowledge to others, since it is an analogue process that requires a kind of simultaneous processing. Tacit and explicit knowledge are complementary, and that both types of knowledge are essential to knowledge creation. Explicit knowledge without tacit insight quickly loses its meaning. Knowledge is created through a continuous dynamic interaction between tacit and explicit knowledge, rather than from tacit or explicit knowledge alone [49].

This interaction relationship between tacit and explicit knowledge was proposed by Nonaka [50] through a simple, but elegant model to account for the generation of knowledge. The process consists of three elements and two interactions. The three elements includes (1) the SECI process, knowledge creation through the conversion of tacit and explicit knowledge; (2) “Ba”, the shared context for knowledge creation; and (3) knowledge assets, the inputs, outputs and moderators of the knowledge-creating process. The two interactions that reflects the importance of institutional learning processes involves: the interaction between tacit and explicit knowledge, between individuals and the organization. The former brings about four major processes of knowledge conversion that constitute the knowledge spiral of knowledge creation. They are: (1) socialization (from tacit knowledge to tacit knowledge); (2) externalization (from tacit knowledge to explicit knowledge); (3) combination (from explicit knowledge to explicit knowledge); and (4) internalization (from explicit knowledge to tacit knowledge).

Socialization

It comprises the exchange of tacit knowledge between individuals in order to convey personal knowledge and experience. Due to the difficulty to formalize and express of tacit knowledge, tacit knowledge conversion acquires shared experience, face-to-face contact, such as spending time

together or living in the same environment. Joint experience results in new shared implicit knowledge, such as common values, mental models, mutual trust and technical skills. In practice, this could mean, for instance, gaining intuitive and personal knowledge through physical proximity and attaining direct communication with customers or a supplier. The traditional apprenticeship is the typical approach of socialization.

Externalization

It describes transformation processes. On the one hand, this means the conversion of implicit into explicit knowledge, and on the other, the exchange of knowledge between individuals and a group. Since implicit knowledge is difficult to express, the conversion process is often supported by the use of metaphors, analogies, language rich in imagery, or stories, as well as visualization aids, like models, diagrams or prototypes. In order to stage a constructive discussion and reach creative conclusions, a deductive or inductive mode of argumentation is also very important.

Combination

The transformation of explicit knowledge into more complex and more systematized explicit knowledge represents the stage combination. It is necessary to combine different fields of explicit knowledge with each other and make new knowledge available on an organization-wide basis. The systematization and refinement increases the practical value of existing knowledge and increases its transferability to all organizational units.

Internalization

It comprises the conversion of organization-wide, explicit knowledge into the implicit knowledge of the individual. This requires from the individual that she/he should be able to recognize personally relevant knowledge within the organization. Continuous learning and the gathering of one’s own experience through "learning-by-doing" may support employees in these internalization processes. In this way capabilities and skills ("know-how") as well as firm visions and guidelines may be

internalized and therefore shared throughout the whole company. This tacit knowledge and the experience gained on an individual level can be shared again through socialization-processes between individuals, so that the knowledge spiral may be set in motion once more.

Knowledge needs a context to be created. The knowledge-creating process is necessarily context-specific in terms of who participates and how they participate. Nonaka consummated the concept of “Ba” based on a concept that was originally proposed by the Japanese philosopher Kitaro Nishida[51] and was further developed by Shimizu[52]. “Ba” is here defined as a shared context in which knowledge is shared, created and utilized. There are four types of Ba that correspond to the four stages of the SECI model: originating Ba, dialoguing Ba, systemizing Ba and exercising Ba, These Ba offer context for a specific step in the knowledge-creating process, though the respective relationships between each single Ba and conversion modes are by no means exclusive.

Originating Ba

Originating Ba is a place where individuals share experiences, feelings, emotions and mental models. It mainly offers a context for socialization, since an individual face-to-face interaction is the only way to capture the full range of physical senses and psycho-emotional reactions, which are important elements in sharing tacit knowledge. Originating Ba is the primary place from which the knowledge-creation process begins.

Dialoguing Ba

Dialoguing Ba is defined by collective and face-to-face interactions. It is the place where individuals' mental models and skills are shared, converted into common terms, and articulated as concepts. Hence, dialoguing Ba mainly offers a context for externalization. The articulated knowledge is also brought back into each individual, and further articulation occurs through self-reflection.

Systemising Ba

Systemising Ba is defined by collective and virtual interactions. Systemizing Ba mainly offers a

context for the combination of existing explicit knowledge, as explicit knowledge can be relatively easily transmitted to a large number of people in written form. Information technology, through such things as on-line networks, groupware, documentation and databanks, offers a virtual collaborative environment for the creation of systemizing Ba.

Exercising Ba

Exercising Ba is defined by individual and virtual interactions. It mainly offers a context for internalization. Here, individuals embody explicit knowledge that is communicated through virtual media, such as written manuals or simulation programs. Exercising Ba synthesizes the transcendence and reflection through action, while dialoguing Ba achieves this through thought.

In a word, Nonaka's theory could be summarized as using the existing knowledge assets, an organization creates new knowledge through the SECI process that takes place in Ba. The knowledge created then becomes part of the knowledge assets of the organization, which become the basis for a new spiral of knowledge creation.

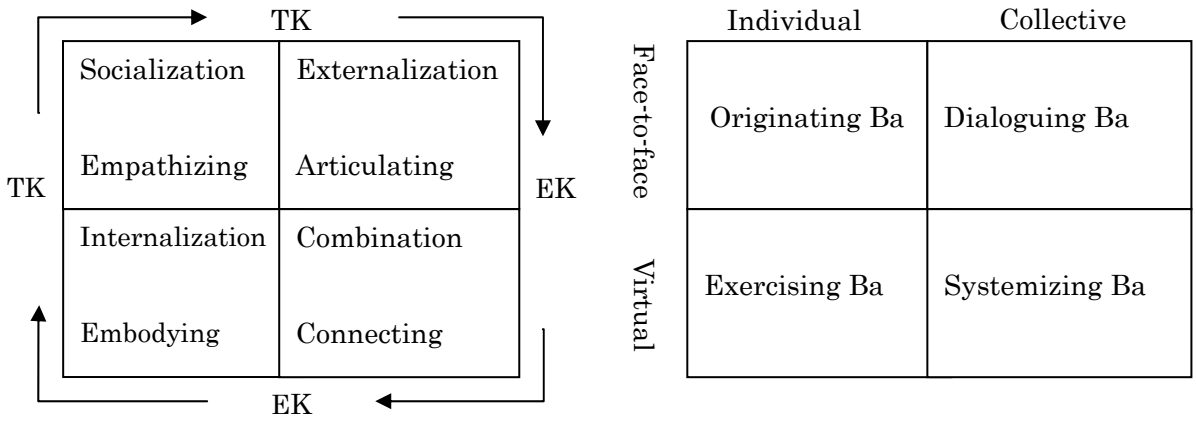


Fig 2-1 SECI process and Ba

2.1.3 Innovation and innovation process

Innovation, the heart of technological change, is essentially the innovation process that depends upon the accumulation and development of relevant knowledge of a wide variety, sometimes defined as the commercial application of new or existing knowledge, is widely recognized as the engine for

economic development. This part aims to provide a general understanding of the innovation process. The history of innovation could be traced back to the writings of Joseph Schumpeter [53], who listed five following different types of innovation:

(1) The introduction of a new good or quality of good

(2) The introduction of a new method of production

(3) The opening of new markets

(4) The discovery of a new source of raw materials

(5) The carrying out of a new organization of any industry

For a long time, innovation was understood as a linear model starting with new technological discovery and ending with new products. In the 1950s and 1960s, the technology-push and then need-pull model emerged. In the former, the development, production and marketing of new technology was assumed to follow a well defined time sequence which began with basic and applied research activities, involved a product development stage, and then led to production and possibly commercialization. In the second model, this linear sequential process emphasized demand and markets as the source of ideas for R&D activities. More recently, innovation has been recognized as a continuous and evolutionary process [54].The presently emerging innovation theory emphasizes the central role of feedback effects between the downstream (market-related) and upstream (technology-related) phases of innovation and the numerous interactions between science, technology and innovation related activities within and among firms. Through interaction and feedback different pieces of knowledge become combined in new ways or knowledge is created[55].The systems of innovation approach [56][57][58] argues that innovation should be seen as an evolutionary, non-linear and interactive process, requiring intensive communication and collaboration between different actors, both within companies as well as between firms and other organizations such as universities, innovation centers, educational institutions, financing institutions, standard setting bodies, industry

associations and government agencies. Through these interaction and feedback, different knowledge will be combined in new ways and new knowledge may be created.

Fig2-2 represents the interactive model of the innovation process, what is referred to as the chain-linked model. In this model, the starting point is the perception of a new market opportunity or a new invention based on novel pieces of scientific and/or technological knowledge followed by the analytical design for a new product or process and testing, redesign and production, and distribution and marketing. The model combines two kinds of feedback loops and two types of interaction. The short feedback loops connect each downstream phase in the central chain with the phase immediately preceding it while the long feedback loops link perceived market demand and product users with phases upstream. One interaction is the production development process in the firm and creates appropriate feedback relationships, intra-organization interaction; the other is inter-organization interaction, the external relationships to a given firm with its customer, supplier, research institutions partners and even competitors. Through these feed and interaction, technological innovation could be regarded as the result of a complex interplay among various actors, with partly common and partly conflicting interests. Innovation process is, thus, depend on how the actors interact with each other, internally and externally. There are large number of empirical study, for example, von Hippel found that a firm's customers and suppliers were its primary sources of innovative ideas, therefore, he argues that a production network with superior knowledge transfer mechanisms among users, suppliers, and manufacturers will be able to 'out-innovate' networks with less effective knowledge-sharing routines[59].By studying the innovation activities in biotechnology industry, Powell *et al.* found that the locus of innovation was in the network level, not the individual firm. Patents were typically filed by a large number of individuals working in different organizations, including biotech firms, pharmaceutical companies, and universities [60] [61].

The close and complicated connection relations among the actors formulate the innovation network.

Many definitions of innovation networks have been proposed. Among them, Tijssen's definition was evaluated by Fischer as "captures the most important features of the network mode": "A network is an evolving mutual dependency system based on resource relationships in which their systemic character is the outcome of interactions, processes, procedures and institutionalization. Activities within such a network involve the creation, combination, exchange, transformation, absorption and exploitation of resources within a wide range of formal and informal relationships." [62]

However, the content, shape, nature of networks differs a lot according to specific circumstance, such as the relationships and linkages between the various actors involved. In a summary, a system of innovation can be though of as consisting of a set of actors or entities such as firms, other organizations and institutions that interact in the generation, use and diffusion of new-and economically useful-knowledge in the production process.

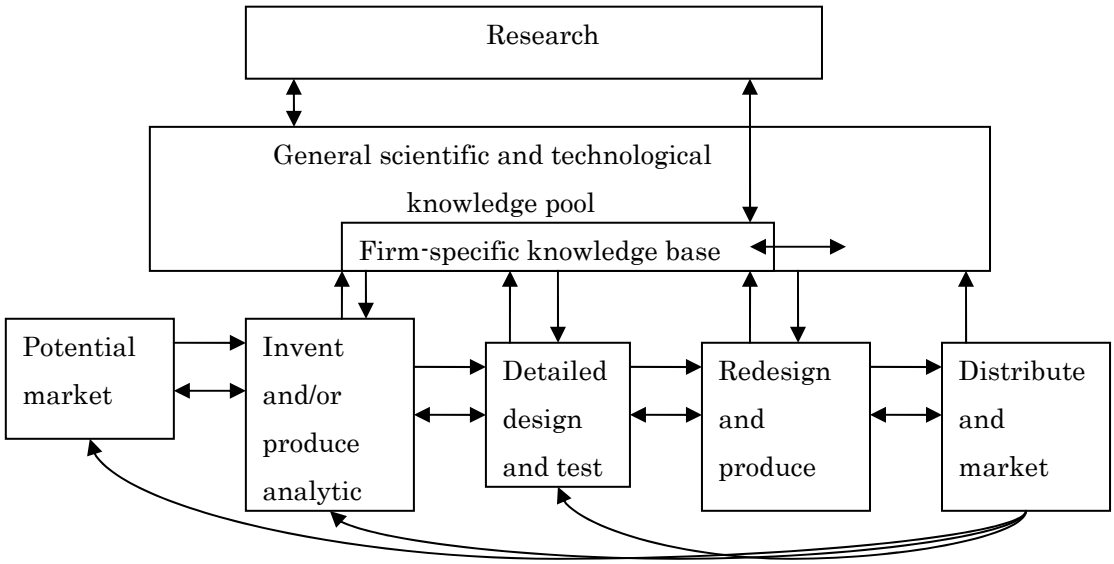


Fig 2-2 An interactive model of the innovation process: feedbacks and interaction
Source: from Fischer's research [55]

2.2 Regional development theory

As the large number of regional economic growth theories, this research adopts Terluin's[63]

classifications which use the relation between the competitiveness of firms and a region's output as a criterion. The regional economic growth theories were divided into four main groups: traditional models, pure agglomeration models, local milieu models and territorial innovation models as shown in Table 2-1.

Territorial innovation models mainly differ from those of others in the sense that the former assumes apart from labour, capital and local milieu factors, the diffusion of innovation becomes an important engine behind growth. In nowadays society dominated by knowledge and with an increasing relevance of services, the static and Ricardian comparative, based on natural resources lose their important whereas those constructed and created are highlighted, the base of which is exactly on the differentiated ability to generate knowledge and innovation.

Table 2-1 Classification of theories in the regional economics debate

	Production function (*)	Theories
Traditional models	Y = f (L, K)	Neoclassical growth theory Keynesian approach: export base theory
Pure agglomeration models	Y = f (AE, L, K)	Cumulative causation theories Growth pole theories New economic geography (NEG) theories
Local milieu models	Y = f (LM, L, K)	Endogenous growth models Theories based on changes in the organization of labour
Territorial innovation models	Y = f (I, LM, L, K)	Incubator theories Product life cycles Theory of the innovative milieu Porter's theory on the competitive advantage of nations Illeris' inductive theory of regional development Storper's theory on the region as a nexus of untraded interdependencies Regional innovation system

(*) Y: Income or output; L: labour; K:capital; AE: agglomeration effects, due to external effects or scale economies; LM: local milieu, which includes factors like space, human

Source: based on the research of Terluin

Among these theories, two recent approaches to the study of innovation process in knowledge–based economies — the systemic and interrelated nature of innovation, and its grounding in dense networks of geographically proximate firms engaged in related types of economic activity[64]. The first approach is found in Michael Porter's work on the process of cluster development [65] [66] [67],

and more applied studies carried out by the former Nordicity Group for the National Research Council [68].The second is rooted in the innovation systems approach at both the national and regional or local level [69] [70] [71] [72]. In this sector, the Porter's cluster theory and regional innovation theory will be reviewed in detail.

2.2.1 Porter's cluster theory

The theoretical origin of "cluster" could retrospect to the work of regional scientist Alfred Marshall who sought to explain the complex dynamics of industrial districts in UK. The early work emphasized the microeconomic benefits of industrial collocation, including that of Allyn Young and Alfred Weber, which theorized that external economies result from the agglomeration of industrial activity. The benefits came from not only scale economies within firms, but also from increased specialization and division of labor among firms, lower transaction costs, and greater access to information. This seminal work informed the emerging field of regional science and the development of industrial location theory in the 1950s and 1960s. Since 1980s, the resilience and differential performance of successful regions and industries has become the center of attention in the academic field. Among them, Silicon Valley and the "Third Italy" (portion of northern Italy encompassing the region of Emilia-Romagna) became models of regional development. The former was lauded by researchers as the emerging center of global high-tech development, for its freewheeling entrepreneurship and dynamic, synergistic relationships between higher education and industry [73]. The latter was noted for its "flexibly specialized" networks of small producers in relatively low-tech industrial sectors like shoe production [74]. In 1990, the term "cluster" was first addressed clearly and forcefully by Michael Porter's in his landmark study The Competitive Advantage of Nations (1990) [75]. Clusters are defined as geographic concentrations of interconnected companies, specialised suppliers, service providers, firms in related industries, and associated organisations (such as universities, standard agencies, trade associations) in a particular field linked by commonalities and complementarities. There is competition as well as

cooperation. Porter claims that clusters have the potential to affect competition in three broad ways, in another words, Clusters offer key competitive advantage over integration in single firms with respect to three key competitiveness variables. These are:

(1) by increasing the productivity of the companies in the cluster, which is enhanced by lower transaction costs and untraded interdependencies;

(2) by driving the direction and pace of innovation in the field, which is dependent upon interactive knowledge exchange between a variety of knowledge actors, especially because of the proximity necessary for tacit knowledge exchange;

(3) by stimulating the formation of new businesses in the field, which is massively assisted by the mentoring, role-model provision, learning, communication and commercialization gains that arise from operating in a cluster setting.

Generally three types of business clusters, based on different kinds of knowledge, are recognized:

(1) Techno clusters - These clusters are high technology-oriented, well adapted to the knowledge economy, and typically have as a core renowned universities and research centers like *Silicon Valley*.

(2) Historic knowhow-based clusters - These are based on more traditional activities that maintain their advantage in know-how over the years, and for some of them, over the centuries. They are often industry specific. For example: London as financial center.

(3) Factor Endowment clusters - They are created because a comparative advantage they might have linked to a geographical position. For example, wine production clusters because of sunny regions surrounded by mountains, where good grapes can grow. This is like certain areas in France, Spain, Chile or California.

According to Porter’s diamond model (See Fig2-3), as a rule competitive advantage of nations is the outcome of four interlinked advanced factors and activities and between companies in these clusters. These can be influenced in a pro-active way by government.

(1) *Factor conditions* – a region's endowment of factors of production, including human, physical, knowledge, capital resources, and infrastructure, which make it more conducive to success in a given industry.

(2) *Demand conditions* – the nature of home demand for a given product or service, which can pressure local firms to innovate faster.

(3) *Related and supporting industries* – networks of buyers and suppliers transacting in close proximity to foster active information exchange, collective learning, and supply-chain innovation.

(4) *Firm strategy, structure, and rivalry* – a climate that combines both intense competition among localized producers, with cooperation and collective action on shared needs, making it fertile for innovation and regional competitive advantage.

Additionally, the role of government is "acting as a catalyst and challenger; it is to encourage - or even push - companies to raise their aspirations and move to higher levels of competitive performance". They must encourage companies to raise their performance, stimulate early demand for advanced products, and focus on specialized factor creation and to stimulate local rivalry by limiting direct cooperation and enforcing anti-trust regulations.

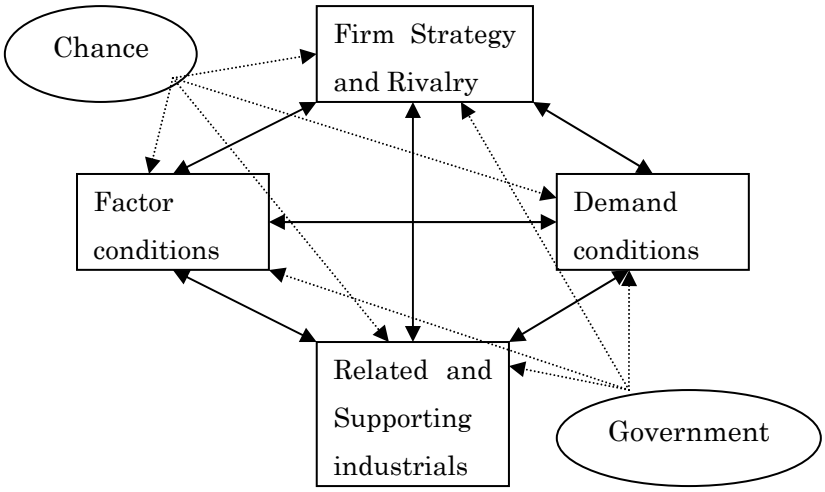


Fig 2-3 Porter's diamond model of advantage

Porter suggests that clusters can be identified through a four stages process:

(1) Initiating with the identification of a large firm or concentration of large firms and then searches for the forward and backward linkages to other firms that feed its activities.

(2) Locating horizontal industries or firms that produce complementary products or services, which usually make use of similar specialized inputs or technologies or share common supply side linkages.

(3) Involving locating the key institutions that provide this network of firms with specialized skills, technology, information, capital or infrastructure.

(4) Concerning the role played by government and other economic development agencies that stimulate or support the activities of the cluster.

Porter's analysis of the key elements that comprise a cluster recognizes the importance of "untraded interdependencies" among firms and supporting institutions. The reasons for cluster formulation include three aspects. 1) Spatial proximity facilitates frequent, close and face to face interaction. Such interaction, both planned/formal and unplanned/informal, fosters and enables learning through interaction. 2) The firms clustered in the same region often share a common regional culture which can act to facilitate the process of social learning. Research indicates that such firms build up a common language or code of communication through repeated interaction over time. As Patel and Pavitt argue, because much of the most important knowledge transmitted between parties in the innovation process is tacit rather than codified, this characteristic confers a crucial advantage on firms which participate in such networks of exchange[76]. 3) This interaction facilitating common language or code of communication is further supported by the creation of regional institutions which help to produce and reinforce a set of rules and conventions governing local firms' behavior and inter firm interaction. To identify the advantages of interaction between firms in the cluster, the horizontal and vertical dimensions of a cluster should be distinguished and identified. The horizontal dimension of a cluster consists of those firms that produce similar goods and compete with one another. Porter has

demonstrated that strong competition and rivalry between firms is an important incentive for innovation and product differentiation [36]. The vertical cluster dimension consists of those firms which are complementary and are inter-linked through a network of supplier, service and customer relations. Once a specialized industry cluster has been established, the firms of this cluster develop a demand for specialized services and supplies. This creates an incentive for suppliers to be near these firms because they form important markets. In locating close to these markets, the suppliers can gain economies of scale and distribute large parts of their production at low costs (i.e. transportation costs).

As a consequence, one would have expected the development of dense networks of transaction and material linkages within a cluster. Overall, the shared knowledge basis enables cluster firms to continuously combine and re-combine similar and non-similar resources to produce new knowledge and innovations. This stimulates economic specialisation within the cluster and results in the development of localized capabilities [77] [78] which are available to cluster firms. These criteria for identifying the presence of clusters in a region subsume many of the same elements that comprise a regional innovation system covered in the following discussion.

2.2.2 Regional innovation system theory

In the past decade a new understanding of the nature of the innovation process has emerged as mentioned in 2.1.3.Thanks to the diligent work of all the other researchers, there are large numbers of valuable literatures which contributed to the system of innovation approach. Traditional concepts like the linear model of innovation or the Schumpeterian view of firms innovating in isolation have been replaced by modern theoretical developments stressing the systemic character of innovation. Initially, the concept of innovation system has been applied to the national level [79][80][81][82][83]. However, the difference of industrial specialization pattern and innovation performance depends on the regions, rather than the nations [84][85][86]. Secondly, knowledge spillovers, which play a key role in the innovation process, are often spatially bounded [87][88][89][90]. Third, it is now well understood that

innovation often takes place during the interaction of tacit knowledge, and the exchange of tacit knowledge requires intensive personal contacts of trust based character which are facilitated by geographical proximity[91][92][93][94][95]. Moreover, policy competences and institutions are partly bound to sub-national territories [96]. Therefore, more recently, the tendency of the academic research scale shifts from nation to region has emerged. [97][98][99][100][101][102][103][104]. Whilst not denying that national (as well as international), technological and sectoral factors are essential, it is argued convincingly that the regional dimension is of key importance.

Definitions of a "regional innovation system" vary; this research adopts the definition as "the set of economic, political and institutional relationships occurring in a given geographical area which generates a collective learning process leading to the rapid diffusion of knowledge and best practice" [105].

Autio [106] provides a schematic illustration of the structuring of regional innovation systems (see Fig 2-4). A RIS is made up by two subsystems embedded in a common regional socioeconomic and cultural setting: The knowledge application and exploitation subsystem includes the companies, their clients, suppliers, competitors as well as their industrial cooperation partners. These constellations are usually referred to as industrial clusters of a region. Ideally, these firms are linked by horizontal and vertical networking. The knowledge generation and diffusion subsystem as the second main building block of a RIS consists of various institutions that are engaged in the production and diffusion of knowledge and skills. Key elements include public research institutions, technology mediating organizations (technology licensing offices, innovation centers, etc.) as well as educational institutions (universities, polytechnics, vocational training institutions, etc.) and workforce mediating organizations. Franz Tödtling included the regional policy dimension which was neglected in Autio's model because the policy actors at this level can play a powerful role in shaping regional innovation processes, providing that there is sufficient regional autonomy to formulate and implement innovation

policies. In the ideal case, there are intensive interactive relationships within and between these subsystems facilitating a continuous flow or exchange of knowledge, resources and human capital.

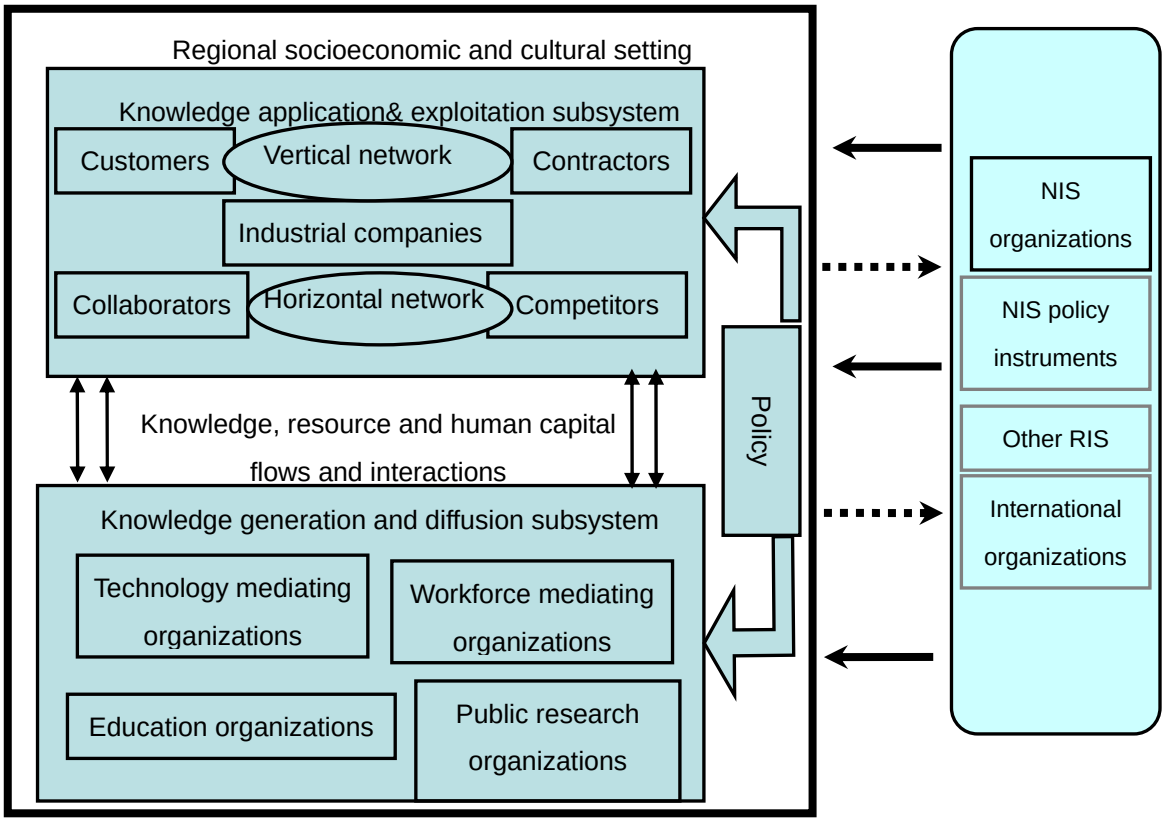


Fig 2-4 Main structure of regional innovation systems.

Source: From Tödtling's research[35]

Regional clustering is seen as a first prerequisite for the emergence of a regional innovation system. However, to constitute an innovation system firms in the cluster have to form regional innovative networks involving more organized and formal co-operation between firms in innovation projects. It is relevant and necessary to distinguish between the two distinct concepts of 'regional cluster' and regional innovation system' in particular when discussing policy implications. Tödtling argues that Clusters are central elements of the knowledge application and exploitation subsystem, whilst the RIS is a wider concept in the sense (1) that there are usually several clusters and many industries in a RIS and (2) that institutions play a larger role. Institutions in this context refer to innovation relevant organizations, rules and behavioral characteristics of firms and actors. Isaksen observed that regional

clusters are seen as mainly a *spontaneous* phenomenon; a geographic concentration of firms often developed through local spinoffs and entrepreneurial activity, whereas regional innovation systems, on the other hand, have a more *planned* and systemic character. Thus, the change from a cluster to an innovation system requires a strengthening of a region's institutional infrastructure, i.e. more knowledge organizations (both regional and national) are involved in innovation co-operation. In this way regional innovation systems may be a tool to create a supportive system of innovation on a regional scale. Furthermore, Isaksen made a hierarchy concept list from cluster to regional innovation network to regional innovation system to learning region.

Table 2-2 Clarification of concepts: A hierarchy of Four Concepts

Source: from Isaksen's research [107]

concepts	Definitions and differences
Regional cluster **Porter (1998)**	**A** concentration of ' interdependent ' firms within the same or adjacent industrial sectors in a small geographic area
Regional innovation network	**I**ncreasingly organized co-operation agreements between firms, stimulated by trust, norms and conventions
Regional innovation system **Philip Cooke (1996-2002)**	**C**o-operation between firms and different organizations for knowledge development and diffusion
Learning regions **Asheim (1998), Boekema (2000)**	**I**ncreasingly organized co-operation with a broader set of civil organizations and public authorities that are embedded in social and regional structures.

The fourth concepts in our hierarchy add another dimension to innovation systems as it broadens the type of actors involved in interactive learning. Asheim[108]uses the concept of learning region to describe a region with an economy embedded in "institutional thickness", while Boekema et al similarly speak of learning regions when "the actors in a region collaborate closely with each other on an institutional level in order to develop and implement regional innovation strategies" [109]. Learning regions must be created by a combination of collective political decisions and bottom-up local initiatives. The creation of regional development coalitions is of strategic importance, i.e. long-term, many-sided patterns of co-operation in support of innovation including actors such as local unions,

local chambers of commerce, local venture capital, local education bodies, local research centers and local authorities. Learning region implies increased public-private partnership in order to develop or regenerate the local economy.

However, as will be pointed out further below, there are also several types of RIS problems and failures such as deficits with respect to organizations and institutions and a lack of relations within and between the subsystems.

2.2.3 Regional innovation system barriers

As Tödtling pointed out, the new policy model in the field of innovation and regional policy which based on the latest concepts of the disciplines as it draws on the key insights of new growth theory, the cluster approach, knowledge economy, and knowledge spillover has without doubt many good and interesting elements. However, the problem is, it is often used in an undifferentiated manner for all kinds of regions. The specific strengths and weaknesses of regions in terms of their industries, knowledge institutions, innovation potential and problems are frequently not sufficiently taken into account.

Furthermore, regions are often dealt with in an isolated manner, i.e. the interrelationships with other regions and with higher spatial levels (national, international) are left out of consideration [35].

The failures of RIS approach may be due to an underdeveloped organizational and institutional set up: Missing or inappropriate elements have negative effects on the innovation potential of regions. Such problems range from limited innovation capabilities of firms to the cluster level. In the latter case the problem can be twofold: On the one hand the region may suffer from the fact that few or no clusters exist (i.e. a lack of regional specialization). On the other hand, the region’s innovation deficiencies may be caused by an overspecialization in traditional industries and outdated technologies. Innovation problems may also result from missing or inappropriate organizations in the RIS subsystem of knowledge generation and diffusion. Again, both the lack of organizations (in the fields of research,

education, technology transfer) as well as a too strong orientation of existing institutions on traditional economic and technological structures may lead to serious innovation problems. Second, inappropriate or missing interaction or links between the different actors and organizations involved in the innovation process may also constitute a major RIS deficiency. Furthermore, many communities in the Region are constrained by declining population rates, lower personal incomes, and a less educated labor force.

In detail, following the typology presented by Isaksen[107], Tödtling differentiate the less favored regions according to the main deficiencies in RIS as follow:

- peripheral regions: low levels of clustering and a weak endowment with relevant institutions ("organisational thinness")
- Some metropolitian regions:a lack of interaction and of networks ("fragmentation"),
- Old industrial areas: situations of "lock in".

As shown in Fig 2-5, it is important to note, that there is no exclusive correspondence between these types of innovation problems and rural regions. On the contrary, in some cases, maybe rural regions in reality face a mix of these deficiencies. Basically, I regard rural areas as one of peripheral area. Therefore, organizational thinness might be the predominant innovation problems in rural regions, which require more attention than others. In the following the main innovation system problems of rural areas are unfolded. A main characteristic of many peripheral regions is that important RIS

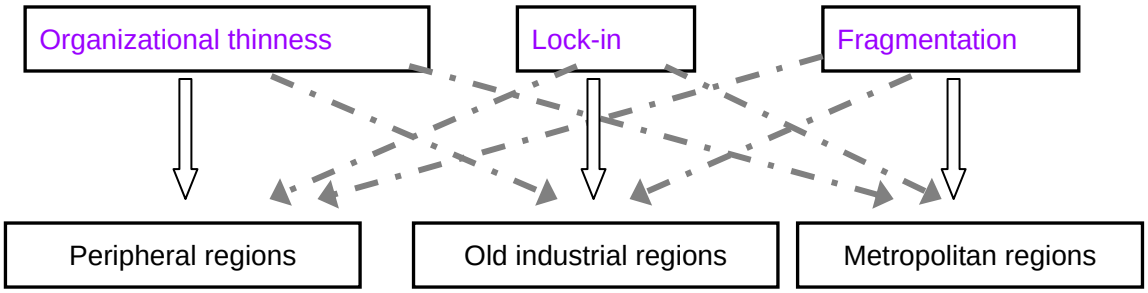


Fig 2-5 RIS deficiencies of types of problem regions

prerequisites are weakly developed as there is a lack of dynamic clusters and of support organizations ("organizational thinness"). In these areas, innovation activities are frequently at a lower level in comparison to more central and agglomerated regions [110][111][112]. Partly due to the dominance of SMEs and/or branch plants, in particular R&D activities, patenting and product innovations new for the market are usually below average. This does not rule out that there are innovative companies in such regions, but often the critical mass for a dynamic cluster development is not reached. If there are clusters they are often in traditional industries with little R&D and innovation activities. The emphasis is on incremental innovation and on process innovations. The low level of R&D does not only hamper the internal innovation activity in the region, it leads also to a low absorption capacity of the regional firms [113]. As a consequence, interregional knowledge spillovers as well as public innovation funds cannot be absorbed to a sufficient extent in such regions [114] [115]. The low level of clustering and agglomeration implies also a "thin" and less specialized structure of knowledge suppliers and educational institutions. Although low and medium level qualifications may be readily available, the more specialized qualifications are rare. Also networks are rather weakly developed in particular those to more specialized knowledge suppliers such as universities and research organizations [116]. Technology transfer organizations have often been set up in the past in order to improve the situation, but they are frequently not effective. In many cases they did not reach the companies or they did not meet their demand well enough [116][117] [118]

In this research, I focus on the development of rural areas that locate in the "periphery". What I mean "periphery" as rural areas that are inherently disadvantageous which may arise from steep topography, mountainous land, scarce water supply, extreme whether, poor transportation access to major markets, or even aging society. The cases I select in this research are rural areas in periphery.

2.3 Rural areas development theory review

From the review of regional development theory, this part moves to the debate on the rural areas development theory which has generated much discussion in the multidisciplinary field of rural studies. In recent years, around the world, due to the difference of natural and historical conditions, rural areas are experiencing entirely different trend. While rural communities with attractive lifestyle amenities, a highly educated workforce, or near a larger urban place may have experienced employment and income growth in recent years [119], communities with smaller populations and relatively low fiscal capacity have not maintained its population or employment [120][121][122]. The gradual depopulation and stagnation herald the demise of the rural communities. In response, many rural communities have initiated various development activates in hopes of attracting, creating, retaining and enhancing local economic activities [123]. In the academic field, rural development also becomes a focus of a heated debate. [63] classified main debates into three approaches: the exogenous development approach, the endogenous development approach and the mixed exogenous/endogenous development approach. These three approaches have different implications for the strategies of local actors and for rural development policy. Sharp distinguished the strategies to industrial recruitment and self-development. Obviously, the former belongs to exogenous approach while the latter belongs to endogenous approach.

Their differences are briefly introduced below.

1) Exogenous development approach

It seems like the exogenous development approach had been the dominant model for rural development until 1970s, especially in America, Europe and Japan. The essence of this model is that rural development is considered as being transplanted into particular regions and externally determined, that benefits of development tend to be exported from the region, and that local values tend to be trampled on[124]. The specific practices are using incentive such as tax abatements,

low-interest loans, and infrastructure improvements to attract firms from outside the community to locate to the area. Communities successful with this strategy can generate substantial and easily enumerated impacts on local employment and economic activity. However, Industrial recruitment has been criticized for a variety of reasons, such as its focus on firms in declining sectors of the economy or the recruitment of firms that are seeking to lower costs[125]. It may not create the quality of jobs a community desires; and once the benefits of the local incentives are realized, the firm may choose to relocate again, perhaps to another country where labor costs are even lower. Arguably, it has received substantial critical attention over years since these policies did not result in sustainable economic development of rural regions [126] [127] [128] [129].

2) Endogenous development approach

Contrary with exogenous model, endogenous development approach often relies on local impulses, grounded mainly on local resources and nurtures local entrepreneurial creativity[130][131][132]. The local economy and local value are respected and the development profit will be retained in the local area [133]. Therefore, the kernel of the rural policy changed to rural diversification, bottom-up approach, support for local business, and provision of suitable training [124] [126].Examples of endogenous development projects include business incubators, downtown revitalization programs, and business retention and expansion programs that focus on locally owned businesses. The presence of a diversity of smaller, often homegrown firms could avoid dependence on a single absentee-owned employer. Factually, during the on-going restructure of manufacturing in USA and Japan, it has already resulted in many rural areas being adversely impacted by the closure or movement of industrial firms that were the primary employers in the community[134].

The community-led rural development [135] [136], Bryden's theory on the potentials of immobile resources for creating competitive advantages in rural area [137], and the creative destruction model of community development [138] belong to the endogenous development approach.

3) Mixed exogenous/endogenous development approach

This approach integrates the advantages of the exogenous and endogenous approaches. It rejects the polarization of the two development models and proposes the approach of interaction of the local and external forces in the control of development processes. This mixed approach emerged in the era of globalization, due to sharp technological changes in the communications and information sectors, which enable local actors involves in both local networks and external networks. Therefore, the interplay between local and external forces to generate synergy comes into being and the local resources could be mobilized to become more productive.

In the current America academic argument of rural development, Torgerson assert that globalization is hurting rural economies in America because they produce goods vulnerable to export conditions. Import substitution and declining demand for manufactured goods has decreased output in manufacturing industries. An abundance of world agriculture stocks affects export of American stocks. Any trade deficits experienced in the United States will affect rural economies more than urban ones[139].Gale and McGranahan examined The income gap between rural areas and metro areas is widening because the ‘new economy’ focuses on service and technology industries found in metro areas, while rural areas tend to rely on older skills in mass production and value-added manufacturing.

Areas gain economic advantage using knowledge, information gathering and processing, and decision making. Rural areas are at a disadvantage because industries of this type tend to agglomerate in urban areas [140]. Stauber’s proposition [141] has also attained wide attention. Stauber argues that rural policy “unfocused, outdated, and ineffective”, the expenditure of billions of federal dollars-----largely directed at subsidizing agribusiness enterprises-----has eroded the rural middle class, impoverished large rural areas, and degraded the rural environment widely. He asserted that rural policy should focus on keeping the rural middle class from relocating to the cities, reducing concentrated rural poverty, and sustain and improve the quality of the natural. However, for several reasons, policy

makers have often overlooked the concerns of rural communities. First, rural out-migration has reduced the relative numbers of rural versus non-rural citizens for the entire history of the nation. In 1920, half the U.S. population resided in urbanized areas, till 2000, the majority 87% of Americans live in the suburbs. Policy makers are more attuned to the concerns of suburban and urban populations. Second, some policy makers consider the rise and fall of small towns a natural process and one that no one should lament [142]. Finally, arguably, farming is a riskier business than ever because of vanished profit margins, and farming counties are strongly represented among the "persistent poverty" counties indentified by the USDA's Economic Research Service[143].

In light of these circumstances, rural should be reconsidered as new role in society. Stauber illustrated five points: (1) to protect and restore the rural environment; (2) to produce high-quality, locally produced food; (3) To create a laboratory of social innovation; (4) To produce healthy, well-educated future citizens; (5) To protect urban overcrowding. Therefore, in order to develop the rural areas, especially the sparsely populated and high poverty areas, which faces especially serious policy challenges and were the losers in the eras of global economic restructuring. Four strategies were proposed:

(1) Increase human capitals by supporting rural colleges and universities in high-poverty areas and encouraging immigration to rural communities [144][120];

(2) Conserve the environment and culture [145];

(3) Invest in infrastructure and new technologies to overcome remoteness and increase competitive advantage [146];

(4) Cultivate social capital [147][148][149][150].

In Europe, to some observes rural development is no more than an addition to the existing pattern of agriculture and rural life. However, some European scholars, represented by Ploeg [151], argue a paradigm shift is also taking place at the level of associated theory in the field of rural development,

which a new rural development paradigm is replacing the modernization paradigm that once dominated policy, practice and theory. They proposed the rural development should be recognized as a multi-level, multi-actors and multi-facetted process rooted in historical traditions. Their arguments based on the foundations of two aspects: first is the marketing demands are changing. The era when cities merely expected the surrounding countryside to supply them with cheap food is over, there are new needs and expectations of producing a broad range of so called non-importable or public goods such as beautiful landscapes and natural values[152][153]; Secondly is the economic model is changing. Economic power and success are not necessarily linked (any longer) to the scale of operation, firms have abandoned models based on economies of scale and vertical integration and increasingly opt for more flexible patterns of organization[154]. Factually, until the early 1990s, scale-enlargement, intensification, specialization, these kind of strong trends towards industrialization in agricultural sector caused rural exodus precipitated by declining farm numbers and a sharp drop in employment opportunities, then the regional disparities increased and tensions grew between farming and landscape, nature, environment and product quality[155][156]. Ploeg admitted that it is impossible and undesirable to refer to rural development as a new "blue-print", but the understanding of what elements should comprise the new model are emerging fast, such as the construction of synergy in social cohesion, farm household pluriactivity, win-win situations between different activities and actors. The viewpoint which depend on the collective action of networks and partnership that involves in many different types of rural actors is very different from the previous modernizational paradigm that heavily emphasized the entrepreneurial capacities of individual farmers. In a summary, the rural development implies the creation of new products and services and the associated development of new markets. It also concerns the development of new forms of cost reduction through the elaboration of new technological trajectories, and the production and reproduction of specific, associated knowledge bases.

Chapter 3 Research question, object, methodology and framework

3.1 Research question

The preceding literature review raises important questions for rural areas in peripheral. Because of their inherent disadvantage, including organizational thinness, the infrastructure necessary for supporting the industry cluster is often not available in rural areas. Even some manufactural employments in rural areas are generally limited to production-level jobs in branch plants that show few clustering tendencies. The policy is imperative to seek effective strategies and policies to promote the economic and community vitality by devising mechanisms through which non-metropolitan regions may, in future, participate in the knowledge-based economy. Maybe it is impractical to expect rural areas to generate frontier knowledge and insert in the production of goods of the latest technological generation. Many rural areas will continue to be specialized in the production of traditional goods, including primary agriculture or simple services.

However, as Johnson & Lundvall state, the learning economy is not necessarily a high technology economy. *"The learning economy is an economy where the ability to learn is crucial for the economic success of individuals, firms, regions, and countries. The learning process refers to the construction of new competencies and the establishment of new specializations and not only to have access to information. Learning is an activity inserted in all parts of the economy, including the traditional sectors and those of plain technology. Countries and regions with low income levels are significantly affected by the learning economy and, in a way, they will need an even stronger construction of competence than that of the metropolises. A learning economy is an economy based on knowledge"* [157].

The primary purpose of this research is to determine the successful factors and mechanism of the formation of the knowledge network in the rural areas. This purpose can be approached through two steps. By scrutinizing each case, the main determining factor may be different. The first step is refining the successful factors case by case, and examining the various characteristics and relationship of these factors. How to organize and operate these elements effectively belongs to the second step concerns about the mechanism to create knowledge network. This part can be divided into two levels, individual and organizational level. For the individual level, the dispensable issue is to check the basic attribute for each agent in the knowledge network, while the organizational level includes the connection and interaction relations among agents. Knowledge is a result of connection and interaction of individuals, organizations. More to the point, connective knowledge requires a dynamic interaction. Connective knowledge is knowledge of the interaction. Therefore, the main task of this research is to study the mechanism of individual level and organization level to foster rural knowledge network. The combined results of this research will provide a basis for a strategic framework of encouraging knowledge network formation in rural region. In addition, the Japanese and Chinese cases will be compared to achieve some more profound understanding of the specificity of each case, as well as universal implication. Meanwhile, by comparing the cases, this research is expected to reveal some new trends which will appear in China soon on the issue of rural areas development.

More specifically, the research objective here is therefore to address three empirical questions:

Question 1: What are the dominant factors of rural regional development?

Question 1.1: What are the exogenous factors?

Question 1.2: What are the endogenous factors?

Question 1.3: What is the interaction relationship among them?

Question 2: **What is the mechanism of the formation of knowledge network in the rural areas?**

Question 2.1: What is the mechanism in individual viewpoint?

Question 2.2: What is the mechanism in organizational viewpoint?

Question 2.3: How does the knowledge interact and how is the knowledge created in the cases?

Question 3: **By comparative studying of the four cases in China and Japan, what is the implication of policy and practice for China and Japan?**

Question 3.1: What are the differences between China and Japan through the comparison case studies on the issue of rural knowledge network establishment?

Question 3.2: what kind of new trend will appear in China soon?

3.2 Object of research

This research selects four successful cases in Japan and China in order to observe the implication of formulation of knowledge network to invigorate the rural economy for bridging the gap between cities and rural areas. The success of these organizations and community initiatives are often difficult to measure given the ever-changing economic landscape inherent to each particular region. Despite these measurement difficulties, it is important to determine why certain organizations and initiatives seem to be more successful than others and what methods of new business creation are the most effective in rural communities. Here, the reasons why these cases are selected will be explained.

Why chose the cases in China and Japan?

China is the developing socialist country with the largest population in the world; Japan is one of the most developed capitalist countries. These two important economic poles in the world have quite different political systems; locate in different economical development stages. However, both facing to severe regional disparity, how to develop the rural areas (depopulation areas) is an urgent problem for two countries. This research attempts to find some commonness which are universal and suitable for many countries, as well as some differences which are worthy of more attention case by case. The implications from this research could be illuminative for the whole world in the field of rural

development.

Why chose these cases?

During the broad investigation in China and Japan, these four cases were selected for two reasons:

(1) Although each case has evolved in a unique way given that each case has its own specialty in many aspects, all these cases have been sharing some basic commonness.

- They used to have disadvantage to develop, say nothing of the conditions to form cluster or RIS. As mentioned before, they locate in periphery. These disadvantages arise from acidity inflation soil, intermediate and mountainous areas, isolated islands, aging society. They could represent the typical rural areas in China and Japan, even with worse natural inherent conditions than the average rural areas.
- After many years' endeavor, they have conquered the disadvantages and attained a sustainable development of a variety of unique local products and services.

(2) Due to their specialty and uniqueness, they place emphasis on different points and the diversity could afford different viewpoints on this research issue. In each case, the research focal point will be different according to result of field research. Each case reflects different elements of the knowledge network and provides different analytical perspective. The particular stress each case lays on is showed in the Table 3-1. "◯" is used to mark the element due to the degree of influence on the success of this case qualitatively; more "◯" indicates that this element might be a more important factor. △ indicates that the element may have exerted a negative impact.

Table 3-1 The comparison of four cases

	FGF	Baixianglin	Irodori	Yaeyama
Governmental function	◯◯◯			△
External spillover	◯◯			
Local resource Re-conception	◯		◯	◯
Local knowledge re-discovery		◯◯		
Joint-vision		◯		◯◯◯
Local leadership		◯◯◯	◯◯◯	◯◯

3.3 Methodology

(1) Field research data collection

In order to have a systematic understanding of the entire process of development in these cases, some of which cover a period of nearly 20 years, qualitative field research is employed as the main research method in the case study part, as it is well suited to the study of social process over time[158]. In order to obtain a deep and comprehensive understanding of the cases, in each case, a certain number of interviewees were chosen to attend the one to one interview. The interviews with government officials and related people from outside were also conducted to get their views on the topics that had been discussed with the communities. It is believed that such effort may avoid the unilateral subjective influence. In additional to review of archival documents and past research, the research which spanned 3 years from 2006 to 2009 was conducted in the forms of field observation and open-ended interview.

(2) Endogenous and exogenous factors analysis

In each case study, its successful factors will be analyzed from two aspects, endogenous and exogenous factors analysis (See Fig 3-1). The former aims to generalize the internal environment and local attributes, includes both the intangible and tangible ingredients, the local resource, local leadership, community joint-vision and local knowledge; the latter, which attempts to examine the external environment and conditions for the rural development, includes the governmental function and external spillover.

(3) Comparative analysis of four cases in China and Japan

Generally speaking, due to the different government intervention style and development stage, which are supposed to be the main reason, the process and measures in the rural development between China and Japan are quite different. After the analysis of the successful factors of each case, the comparative analysis will be unfolded between China and Japan. The start point of this step is: the similarity of four cases indicates dominant factors for rural regional development; the difference

indicates the mechanism for establishing the knowledge network. Moreover, the comparative analysis

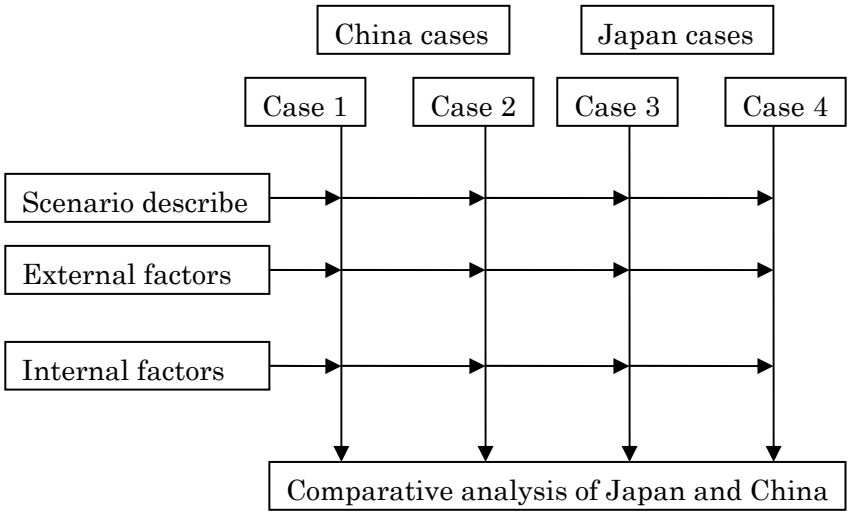


Fig 3-1 Framework of case analysis

aims to deepen the understanding of the knowledge network mechanism and also ingeminate the argument of this research that there is no single best practice policy approach applicable everywhere. Instead of plea for a fits-to-all policy solution, a "tailor-made" knowledge network approach addressing the specific challenges, problems and opportunities found in each region has to be made. This empirical study will afford some practical implication for the policy makers.

(4) Organizational mechanism and process analysis

The formation mechanism of the knowledge network can be approached at individual and organizational levels, which includes the connection relations among agents and knowledge interaction in the organization. In the organization level, the connection mechanism is examined in the perspective of social network. Social network analysis (SNA) provides a rich and systematic means of assessing informal networks by mapping and analyzing relationships among people, teams, departments or even entire organizations. The standpoints of SNA are employed in the connection mechanism analysis. Following the organizational analysis, the knowledge interaction and flowing analysis are deployed based on SECI model. The kernels of the rural knowledge network will be exhibited.

Chapter 4 Case study

4.1 Five Golden Flowers

As the largest city in the western China, as well as the center of science and technology, business trade, financial, transportation and communications in southwest area, Chengdu with its neighbor Chongqing are joining forces on the Chengdu-Chongqing Economic Zone, aiming at turning the zone into an engine of economic growth in West China. In 2007, Chengdu and Chongqing were selected as the pilot areas[14]. In the suburb of Chengdu city, the new force suddenly rose of Five Golden Flowers, was described as a model in the urbanization process. The local interviewees said even themselves were marveled by the large change occurred during these years.

4.1.1 Description of Five Golden Flowers

1) Geographical and fore passed status

Fig4-1 illustrates the location of the main places referred to in this paper. Chengdu governs 9 sections, 4 towns and 6 counties, and covers 12,390 square kilometers, has a population of 12 million, urban population is 7.31 million, accounting for 59.9%; rural population is 4.9 million, accounting for 40.15% (Bureau of Statistics of Chengdu, 1% population sample investigation bulletin in 2005). In

[14]June 7, 2007, the document (〔2007〕No.1248) was issued by the National Development and Reform Commission (NDRC): Chongqing and Chengdu have been selected as pilot reform cities targeting coordinated rural and urban development through reforms in all sectors. The country's top economic planner, urged the two cities to take the initiatives in pushing forward comprehensive reforms in order to achieve coordinated and balanced development between urban and rural areas. The State Council, or the cabinet, has approved the establishment of the pilot reform cities of two cities. The final aim of coordinated rural and urban development is to make rural farmers and migrant workers able to enjoy the same rights, public services and living conditions as urban residents do. They are just two more pilot reform cities following southern Shenzhen, eastern Shanghai's Pudong New Area and northern Tianjin's Binhai New Area. The two pilot cities have pledged to carry out reforms in such areas as household registration systems, land management, social security and government administration.

2005, the urban per capita disposable income was 11,359 Yuan and rural per capita net income was 4,485 Yuan. Compared with 3,655 Yuan in 2003, the rural net income shows a 22.7% increase in two years, especially with an increase rate of 42.8% in Jinjiang section which rarely occurred in the whole of China. The Five Golden Flowers is located in Jinjiang section. As a matter of fact, they are five villages of Sansheng country in Jinjiang section. Sansheng County is only 7 kilometers away from the center of Chengdu, and 5 kilometers from the Erhuan Road, between Sanhuan Road and bypass highway.

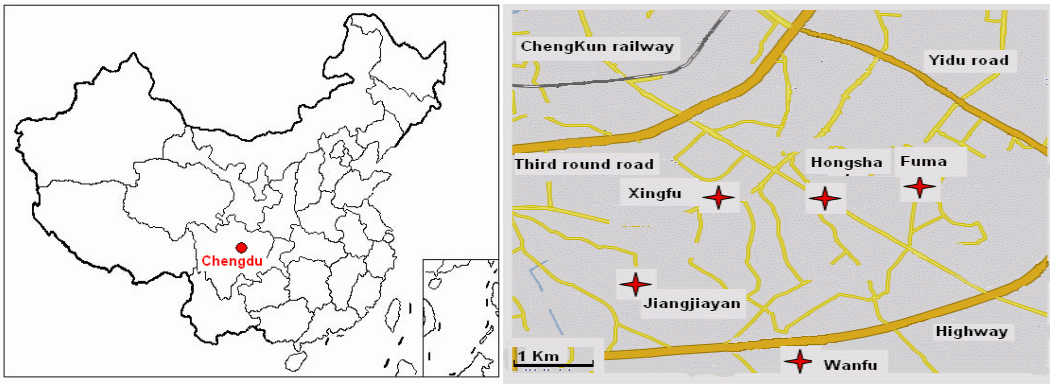


Fig 4-1 Location of Five Golden Flowers

Due to its location at the city entrance area, this region is unavailable to be used as construction land according to the regulation. The soil texture belongs to the Longquan cordillera acidity inflation soil, which is unsuitable to plant foodstuff.

Five Golden Flowers' flower industry experience can be traced back to Qianlong period (1736-1795), about 300 years ago. From the early 1980s, the household responsibility system was introduced. The communal land was redistributed to peasant households, so that each household received its own roughly equal allocation of land (either per capita, or per adult, or per male adult, depending on the region). The population in Sansheng country was 18,347, with a 93.4% of agricultural population, 12,676 mu agrarian squares were more or less equally distributed, resulting in a small average of 0.7 Mu[15] per household member. The flower industry used to be dispersed and

[15] Mu is a customary and traditional measure units of area used in China. 1 Mu equals one-fifteenth hectare.

small, family-scale, using inefficient and obsolete technology. The village people mentioned that one of the Five Golden Flowers----Hongsha village was even called Siberian of Chengdu in 80s.

2) Status quo

As marked in the Fig.4-1, Five Golden Flowers consists of five villages as follows: Wanfu village, which is called He Tang Yue Se, means “Moonlight over the Lotus Pond”, encompasses 1074 Mu regulated area, with lotus as primary flower, auxiliary by spatterdock, late lotus, drawing an ecology lotus pond landscape. Fuma village, called Dongli Juyuan, which means “Dongli chrysanthemum garden”. Xifu village, called Xinfu meilin, which means “Happiness plum forest”, with about 3000 Mu plum forest. Xinfu meilin develops sightseeing industry based on the plum blossom culture and plum blossom industry chain. The fourth village is Jiangjiayan village, which was called Jiangjia Caidi, means “Jiangjia vegetable yard”. Here, the Renzhong manner has transformed the traditional agricultural industry to a leisure industry, and modernized the interaction between city and countryside. The last member of the Five Golden Flowers is Hongsha village, called Hua xiang nongju, which means “flower farmer residence”. It has been assessed as a national AAAA level scenery place. The potted flower, cut flowers, ornamental fresh flowers and tourism are the dominant industry in Hongsha village.

3) Two unique rural business manners

(1) Happy Farmhouse

Happy Farmhouse is one type of tourism, which takes the countryside landscape, the attractive environment, the countryside folk culture and customs and atmosphere of farm life as basic tourism resources, the farmers’ residence as the unit of business, the experiences of the village life as the marketable product. The main tourist activities are eating the peasant family’s food, living in an agricultural house, doing agricultural work and enjoying contacting with a peasant family. (cf. Sichuan Province Chengdu city: “The General statue of service quality in Chengdu Happy Farmhouse”) .The

Happy Farmhouse system not only affords a new leisure form and an amusement space, but also plays a vital role in reforming farmers' industrial structure and increasing farmers' income.

In Sichuan province, at the end of 2005, there were 17,037 Happy Farmhouses, with 237,970 employees and nearly 500,000 indirectly employed farmers. These Happy Farmhouses hosted 82.44 million tourists for a reception income of 246.8 million Yuan[16].

Happy Farmhouse, which received an average of 10,000 tourists per day, had become one of the dominant industries in Five Golden Flowers. In Hongsha village, for example, there are more than 90 Happy Farmhouses.

(2) Renzhong manner

Renzhong manner was developed by Jiangjia vegetable yard, which provides clients with the opportunity to plant, watch and taste the green vegetables. At present, the advertising slogan is "Be a farmer by 800 Yuan a year". As the term suggests, for that small fee anyone can have a vegetable garden (one tenth of a Mu) in Jiangjia vegetable yard, and such services as growing seedlings, planting or harvesting are charged by the land owner. The tourist can participate according to his or her own interest, and the agricultural produce, will be completely processed by the tourist. Renzhong manner currently attracts hundreds of tourists each year.

4) Development procedure

(1) Hardware----infrastructure construction

From 2003, Jinjing government began improving rural infrastructure in Sansheng county, the basic principle was described as constructing this area as sightseeing place appropriately, maintaining the ecological environment. It involves:

- Rehabilitation of the rural residences. Adding external ornament as normative western Sichuan farmer residence style. During the first phase, the government paid 80% of the reconstruction fee.

16 Source: China tourism newspaper: 2006

- Urbanization of rural infrastructure. Road net, sewage treatment, natural gas pipelines and water supply were built with the appropriating funds from government.
- Modernization of the accessory facility. Countryside cable TV terminal households were increased to 1500 units and optical fiber was installed in each household. According to construction regulation of the community health service center, a 200 square meters health service center was built in Five Golden Flowers.
- Construction of ecological landscape. Green plaza, Niu Wangmiao were rebuilt, the protection of ecological vegetation was underway, and the “Agricultural Civilization Memory Hall” was built.
- Large-scale land management. Under the premise of not reducing the original cultivated area, the land was rearranged by dismantling the courtyards, the ridge of field and so on. The concentrative construction land were auctioned or used for commercial development.
- Introduction of Company & Project Foundation. Supports were afforded to the floriculture companies in the aspects of fund, technology and policy from different departments of government.
- Financial assistance. Low or no interest loans were afforded to the local entrepreneurships, to encourage them to create their own business.

(2) Software----culture factor, education, training, social security system

The cultural and industrial factors were introduced into the Five Golden Flowers to promote the development from traditional agriculture industry to the leisure economy. Furthermore, the government paid special attention to cultivate the independent competition of the local people. It involves:

- Increase cultural attachment value to the traditional industry. The first “Sichuan flower exposition” was held in Five Golden Flowers on September 29th, 2003; the first “China•Chengdu plum blossom festival” was held in Xinfu Meilin on December 27th, 2004. Hetang Yuese was endowed with the connotation of music and the drawing art by building special artist village. Reappearance of

agricultural culture civilization was underway in Jiangjia Caidi; The chrysanthemum flavor was shown in Dongli Juyuan. Complementation and mutualism of the cultural industry and agricultural industry was implemented.

- Social security system was constructed for the local people. All the peasants have been completely included in the new rural cooperatives medical service. 92% land-lost, 62% quasi-land-lost peasants have participated in the social endowment insurance system.
- Experts and consultants were invited to train or educate the peasants in the field of flower industry or restaurant. The governors in Hongsha village declared in our interview that they have held lots of training lectures or symposiums from 2003. What is more, just one month ago, the manager from Minshan restaurant (five stars hotel in Chengdu) worked one month in Hongsha village, instructing every Happy Farmhouse on site.

5) Input-output analysis

From the initiative of the Five Golden Flowers in 2003, the section government (including the country government) has invested 97.45 million Yuan, and municipal government has invested 18 million, amounting to 115.45 million. Simultaneously, a massive of social fund investment also has involved in the project operation, reaching 1670 million Yuan, among them, Huaxiang Nongju (1000 million Yuan), Xinfu Meilin(40 millionYuan), Jiangjia Caidi(10 million Yuan), Dongli Juyuan(1 million Yuan), Hetang Yuese (about 16 million Yuan). We analyze the input-output benefit in two aspects, the social and the economical efficiency.

(1) Social efficiency

Five Golden Flowers encompasses approximately 12 square Kilometers. According to the conventional urbanization standard (including park construction), the average investment needed to construct the basic infrastructures and urbanize a square kilometer is approximately 150 million RMB (empirical and statistical estimate of Chengdu municipal construction). Thus, 1800 billion RMB

should be needed in the Five Golden Flowers. However, in fact, each square kilometer was invested only 15 million RMB. The entire area was invested less than l80 million RMB, but formed a leisure open style park with attractive rural scenery and harmonious ecological environment for the citizens, where millions of people come for vacation each year. Moreover, it has attracted multitudinous agricultural enterprises and management merchants, Due to the improvement of the countryside infrastructure, the change of the traditional life and production method, the peasants can also enjoy the city civilization. It largely promoted the urbanization progress.

(2) Economical efficiency

The economical efficiency was summarized as follows:

- Output growth of the floriculture industry. From 41.24 million RMB in 2000, it extended to 65.6 million RMB in 2005, with a 59.l% increment.
- The tourism income. Till now, Five Golden Flowers has received about 11 million tourists, with reception income of 234 million RMB.
- The appreciation of peasants' properties. For the improvement of the countryside environment, the rent of land raised from 1,005 to 2,000 RMB per Mu. The price of reconstructed residences rose from 500 to 1600 RMB per square meter. The appreciation of the peasants' household properties has surpassed 1.3 billion RMB in Five Golden Flowers.
- The increase of peasants' income. The peasants' income composes four stable parts: rent, salary, bonus and welfare. In 2005, the per capita net income in Five Golden Flowers reached 6,321 RMB, especially in Hongsha Village, it reached 7,060 RMB, with an increase of 40.5% compared with 2003.
- The appreciation of the collective property. The collective property of Five Golden Flowers was 8.373 million RMB in 2002. In 2005, it reached 35.83 million RMB; the annual increased rate was 122%.
- Increase of tax revenue. It increased to 12 million RMB in 2005, from 0.401 million in 2002, with a 300% annual increase rate. During these three years, the average increase of the financial revenue in

Jingjiang section is above 20%.Taking this data as the evaluation standard, the investment recovery period of Five Golden Flowers is about 9 years.

4.1.2 Analysis and discussion

1) Government function

Given the short development history of the Five Golden Flowers, it is still difficult to evaluate its long-term effects on society and regional economy. However, the determinant factor is obvious-----the government function, particularly at the early stage when government dominate the overall process of both software and hardware establishment. In the rural development progress, the function of the government should be generally regarded as a sine qua non.

In developing countries, governments usually tend to take a more active role in the regional development and operation of projects, due to the scarcity of resources and the absence of a strong and experienced private sector[159][160]. From other viewpoint, some researchers worried about that China's current vertical bureaucratic system, which lacks a clear definition of governments' respective purviews and commitments in administration [161], maybe enables the governments to intervene into the rural development to an optional extent, according to their practical interests and needs. Especially, several defects of the over control of the Chinese government in tourism development have been pointed out [162]. These issues, the proper role of the government in the rural development and what kind of strategy to adopt, are hotly debated.

In the process of the rural development, there has been a significant transformation in the model of urbanization in post-reform China, a society dominated by a large rural population but with accelerated industrialization and development. In the context of Five Golden Flowers, it is hard to classify it whether it is state sponsored urbanization (urbanization from above) or spontaneous urbanization (urbanization from below) as Shen[163] mentioned. The development of Five Golden Flowers is unique and creative. The roles that the Chinese government (includes the Chengdu

municipal, Jinjiang section and local governments) has played can be evaluated as six roles and three dimensions. Six roles mean operator, regulator, investment stimulator, promoter, coordinator, as well as educator; three dimensions consist of constructing the platform, insuring no fear of trouble in the rear, and presenting tools. Concretely, the government, as the biggest player and initiator, operates the project from macro and holistic point of view, such as regulating the statutes and condition, promoting the infrastructure and living environment, stimulating the external and internal investment, coordinating the relationships among the communities, household families, external capitals and so on. The explicit achievements can be depicted as three dimensions: firstly, the business platform has been constructed where the local people can select a suitable approach to make use of their resources: operating their own flower business or Happy Farmhouse, Renzhong their lands, working in the companies, etc. Secondly, no fear of trouble in the rear was somehow guaranteed by the availability of medical insurance, endowment insurance, for-free compulsory education system, particularly the first two subjects which used to be only citizens' welfare. Last but not least, the tool that was endowed to the local people includes material and spiritual aspects. On one hand, the traditional isolated flower production has been changed to the extensive, large-scale management business, the rural tourism industry has been soundly developed, and local people gradually master the business management knowledge by training, educating and experience. On the other hand, this pattern is not only simply changing the household registration status (hukou) of the peasants from the countryside to urban, but also promoting the integration of the urban and rural. Urban residents engage in sightseeing, operating business or Renzhong land. Peasants also can experience the citizen life more conveniently and initiatively than before. Such kind of bidirectional ideological interaction should contribute to update the ideological system of the local people.

In substance, what the government has fulfilled is affording platform for the autonomy establishment of the local people and communities. It appears that the Five Golden Flowers has

sufficient momentum to become self-sustaining next step.

2) External knowledge introduction

In FGF, the external spillover includes three varieties. First, the professional chiefs and managers from the famous hotel are invited to train the Happy Farmhouse and give advice; Second is industry recruitment, which has two forms: One is that external flower firms are introduced by favored policies directly, including some international companies, the other is introducing some agricultural research organizations which makes the joint venture with local farmer together, formers use their knowledge and technology, while the local farmers use their land as stock of the company, farmers are not only one the employees in the company, but one of the owners. Third, artists are introduced into FGF. Since 2008, a new conception “one village, one art” has been proposed and implemented to overcome the disadvantage of seasonal problem of flowers.

3) Re-conception and reconfiguration of the local resources

The main theme of the tourism industry in Five Golden Flowers was rural tourism at the first stage. How to reconfigure effectively the traditional countryside resource was a difficult problem. The target is effectively utilizing the local resource, carrying forward the local tradition while endowing them modern interpretation. For example, before 2003, farmers had no alternative but plant flowers and vegetables because their land was not suitable for paddy. However, flowers and vegetables have become an indispensable elements for rural tourism; The large scale of swamp lands was unfrequented all the time, however, after planting lotus, the wetlands has become the first choice of tourists for watching lotus, in the season of lotus, and thousands of people stroll along the road here; the obsolete cottages have been restored to build the Museum of Agricultural History, where the outdated farm tools and rural family commodities are exhibited.

Table 4-1 Five Golden Flowers

Name	Meaning of the name	One season	One flower	One art
Hua xiang nong ju	Flower farmer residence	Spring	Bonsai, potted flower, cut flowers	Originality
He Tang Yue Se	Moonlight over the Lotus Pond	Summer	spatterdock, late lotus	Painting
Dongli Juyuan	Dongli chrysanthemum garden	Autumn	chrysanthemum	Photography
Xinfu meilin	Happiness plum forest	Winter	Plum	Folk-custom
Jiangjia Caidi	Jiangjia vegetable yard		Vegetable	Sculpture

4.2 Baixianglin case

4.2.1 Scenario description

1) Background introduction

Guizhou is the province with the highest number of minority groups on the eastern section of the Yunnan-Guizhou Plateau in southwestern China. It is a relatively poor and undeveloped province, with a nominal GDP for 2007 of 254.3 billion RMB, ranking the last 6th. The GDP per capita was 6,742 RMB, rendering it the lowest in the PRC[17]. As shown in the Fig 4-2, Baixianglin, in the northwest of Guizhou, is the headstream of Chishui and two branches of Wujiang River, and also the converging point of Dalou and Wumeng cordillera. Baixianglin is typical karstic topography. According to the statistics in 1984, due to over-disafforestation in the steel-making in 1950s and the Great Leap Forward in 1960s, Baixianglin's ecological environment was severely damaged. As a result of the soil erosion and desertification, the grain production per capita decreased to less than 100 Kilograms and the per capita income was less than 100 RMB. In order to survive, people had to continue destroying the forests for land reclamation, falling into a vicious circle "Poorer, more reclamation; More

Fig 4-2 The location of Baixianglin

[17] At the same year, Shanghai with the 65473 RMB of per capita GDP ranked in the first of PRC.

reclamation, poorer". The local government made some efforts to organize a forestation plan to rehabilitate the ecology, but this effort did not produce any significant result.

The reasons may be as follows:

(1) At that time, the forestation activity organized by local government was a passive reaction to some national policies. The purpose was only completing some mandatory targets. It was very difficult to bring into play the initiative of the villagers.

(2) For various reasons, as well as historical policies, the villagers lacked trust on the local administrative organizations, and sometimes, serious conflict between the villagers and local government happened. Villagers did not actively join the project organized by the local government.

(3) The local governmental organizations lacked understanding on the significance of forestation. Without supervisory measures, the planted seedlings were not taken good care. The scale of forestation could not even outweigh the deforestation activities.

(4) The socio-cultural landscape of Baixianglin was an immigrant community, with people from all around the province. Members belong to different nations, with their own special national characteristics. The complexity of the community caused additional difficulties in the community management, resource protection or solidarity of the villagers.

Under such background, the forestation organized by local government was unable to effectively relieve the crisis of desertification. In 1980s, an expert from Beijing examined the ecology around Baixianglin, estimating that millions of RMB and at least half a century would be indispensable to restore the ecological status quo ante.

2) Status quo

After 20 years of efforts~~,~~ in Baixianglin, the grain production per capita achieved 300 Kilograms, three times as much as in 1984, and income per capita reached 2,300 RMB, 20 times as much as in 1984. The collective organization Highlands Afforestation Cooperation (HFC), which was initiated by

27 households of 124 villagers, has now 314 households with 1319 villagers from 6 villages, including Han, Miao and Yi nations. During the last 20 years, HFC has converted 4090 Mu of cropland to forests and afforested other 8,000 Mu. The forest cover rate of Baixianglin area has increased from 17.7% to 75 %. The volume of living trees reached 14,160,000 cubic meters and the total output value reached more than 80 million RMB.

Thanks to the forest, ecological environment has been improved and the local climate has changed: Water resources have been improved and soil erosion has been alleviated effectively. Since 1994, there have never been floods; the mouth of the spring, which had been dried up began to produce water again. Many villagers can now obtain spring water by connecting a pipe to their house, while before they had to walk several Km to find drinking water. Rare animals, such as the white tail pheasant, the Chinese Leopard and the clouded leopard have resettled in the forest.

People's eco-behavior has gradually improved. For more than 20 years, no forest fires or illegal tree felling occurred. Villagers do not use the humus from the forest on the farmland as fertilizer any more because it will break the ecological balance of the forest. Miao people, who used to enjoy hunting, stop doing even when the wild animals attack the livestock. The director of the women's unit, and wife of the local leader, was awarded the Earth Award[18] in 2003.

[18] The Earth Award, Established in 1997, was sanctified by State Environmental Policy Act (SEPA) and Hong Kong and Macao Affairs Office of the State Council，jointly organized by China Federation of Environmental Journalists and the Hong Kong-based charity Friends of the Earth, presented its awards on the eve of International Earth Day in the hopes of inspiring the public to better protect the environment annually. This great award is to honor domestic reporters, teaching staff, community and youth group who make outstanding contribution in the field of environment. Ten people each received awards of 40,000 Yuan (US$5,000) and ten nominees were given 10,000 yuan (US$1,250) each. The Earth Award is the highest environmental prize in the country. Among the 39 winner of the 7th Earth Award, over 80% of them come from grass roots and 30%of them come from West China.

4.2.2 Analysis and discussion

Forestation in partially devastated mountains is an acknowledged difficult problem. Due to its specialty and complication of the ecological conditions, using the external knowledge may not attain the expected results. In the successful forestation of Baixianglin, besides external knowledge learning, indigenous knowledge exploitation played a determinant role. The local leader, Mr. Yang Mingsheng, who is also the knowledge leader, organized the community members together and formed an autonomous decentralized organization------HFC. HFC is also a knowledge sharing, transferring and creation organization. In this network, the joint vision acknowledged by all the members facilitates the knowledge interaction among them. Due to the join vision, knowledge learning and knowledge exploitation activities carried out in full swing. The analysis will focus on three aspects as following.

1) Local leadership------knowledge leader

1984 was the sixth year of Yan Mingsheng's term as a Party Secretary of Pingba town (Higher administrative authority of Baixianglin). After long-term observation, he believed he had found the root of local poverty: A large number of mountain resources were not fully developed and used rational. He thought that if the farmers were motivated, the poverty could be alleviated. He applied for a leave without paying and returned to Baixianglin to afforest the mountains along with the villagers. Coincidently, there were some special policies for supporting poverty mitigation. The higher government approved his application with "leave with paying" (means he is allowed to leave the position but still get salary from government). He made the promise of foresting 6000 Mu in five years. As mentioned before, experts had made pessimistic evaluations regarding forestation in Baixianglin. However, Yan Mingsheng believed it was absolutely possible to afforest the stone mountains because trees can grow even on a cliff. In order to convince and mobilize villagers, he visited them door-to-door, mountain to mountain. His wife also helped him to do the education and motivation among female villagers.

Since 1985, Yang Mingsheng and his family worked from dawn to dusk on the mountain, sometimes even sleeping there. His hardworking set a good example for all the villagers. Every time, when he got some supportive agricultural resource from top government or cultivated some high-quality nursery stocks, he always provided them for other villagers. During these 20 years, he has afforded millions of high-quality seedling to the villagers. When villagers had any trouble, Yang Mingsheng always did his best to help them. By the influence of Yang Mingsheng, villagers started to help each other on their own initiative.

Yang Mingsheng is not only the community leader, but also the knowledge leader. He studied at the College of Agriculture, and his father, who used to be a folk healer in the village, mastered a lot of knowledge about climate and plants and transferred this knowledge to him. Therefore, compared with other villagers, Yang Mingsheng had more knowledge about the local climate, condition of soil and plants. Theory integrated with experience, Yang Mingsheng gradually found some effective forestation methods adapted to the area. At the same time, he subscribed to 18 publications about forestry and agriculture at his own expense for the whole community. In addition, he went to Sichuan province on his own to learn gallnut cultivation techniques. Then he taught the villagers all the knowledge he mastered without any reservation.

2) Joint vision of the self organization-----HFC

After Yang Mingsheng returned to Baixianglin, he persuaded all his relatives and friends to cooperate and build up the HFC. The expression “Four civilizations[19]” was put forward by Yang Mingsheng as the common vision of the HFC, which condensed the villagers’ wishes of the future.

[19] Ecological civilization is first and foremost, every household participates in tree planting to improve the ecological environment. The production civilization means abandoning the deforestation style production methods, adopting sound agricultural practices to increase agricultural production efficiency. Birth civilization means advocating healthy pregnancy and scientific nurture and education. Living civilization means building the harmonious families, and community where people love and help each other.

Based on the “Four civilizations”, after deep discussion and negotiation, HFC instituted the “Four unifications, one separation” management system. The attractive vision and the rational system attracted more and more villagers to join the organization. This is the solid foundation that allowed the sustainable development of HFC during the past 20 years. “Four civilizations” refers to the ecological civilization, production civilization, living civilization and procreation civilization. To form the joint vision, it is a prerequisite for leaders to share experiences with the villagers which will produce an empathic effect. At the same time, long-term and assiduous propaganda and education are also necessary.

The only “theft” incident happened in winter 1986, one villager cut down a fir tree of another villager's worth around 30 RMB. When the he noticed he made the mistake, he returned the timber initiatively. However, according to the regulation, he had to be fined. In order to educate all the villagers in the future, Yang Mingsheng afforded the villager 10 RMB to let he invite the film projection team to come to the village to project a film for all the villagers. This villager apologized in the scene, “I invite you to see the movie because I cut Yang's tree by mistake, and I apologize to all you!” All villagers knew it and since then on, in such large areas of fruit trees, medicinal herbs and fir forest, no theft incidents happened.

“Four unifications, one separation” means “Unified leadership, unified planning, unified service, unified supervision, but separate management and individual responsibility for their profits or losses.” “Four unifications” integrated the resources and afforded the complete service, “One separation” made clear property and responsibility, mobilized public participation and enthusiasm, while at the same time ensured the flexibility of independent operation.

- Unified leadership. The leading group of HFC has one director and four deputy directors, most of them are Party members or league members. A number of forestation groups belong to HFC. Each group has a manager. The director and the group heads, democratically elected by the

members, instruct and coordinate the activities during their tour of duty.

- Unified planning. Forestry industry has slow effects due to its long production cycle. HFC adopted a long, medium and short term project combination strategy which implemented an unified planning and harmonic arrangement of all the food crops, cash crops and timber trees to achieve the balance between the main and sideline production. The short-term strategy was to expand grain production and breeding to speed up the cash circle, to foster reforestation seedlings and to pay close attention to the plants which can produce economic benefit within one year, such as the honeysuckle, mushrooms or veiled lady. The medium-term strategy was to foster the economic forest which can produce profit relatively fast, such as enutgall, eucommia, phellodendron, raw lacquer, and paulownia. The long-term strategy was to foster areas of timber trees, such as pine, fir, and metasequoia trees.
- Unified service. HFC provided 6 series of services for all the members. First, HFC takes charge of the purchase and transportation of all nursery stock, green manure, seeds, plastic film, pesticide and so on, to ensure good quality and low cost; Second, HFC provides a variety of science and technology training for villagers; Third, HFC is in charge of pest prevention and eradication; Fourth, HFC made the mutual aid-for-work system to solve the lack of labor force; Fifth, HFC is in charge of the financing; Sixth, HFC seeks sale channels and opens up market for the agriculture and forestry products of the villagers.
- Unified supervision. In order to maintain the sustainable development of the forest, HFC members instituted the “Forest supervision Convention”, which prohibited the destruction of nursery stock, deforestation, land reclamation and depasturing in the young forest.
- Separate management and sole responsibility for their profits or losses. The basic principle is “Who plants, who owns, who gets the benefit”. The management ownership of the forests is allowed to be inherited or transferred. Members have the management right of all the cash crops

and any other native products in their forests. They are exclusively responsible for their profits or losses. HFC takes no profit from them.

Consequently, an autonomous distributed network in Baixianglin is formed. “Four civilizations” is the joint vision, and “Four unifications, One separation” is the collaboration and implementation mechanism.

3) Local tacit knowledge exploitation

Baixianglin case also implicates in sustainable rural development, developing and utilizing the local tacit knowledge which was formed in the long-term production and living practice is as important as learning advanced knowledge from outside. Forestation on the barren rock mountains is an acknowledged difficulty among forestry experts. However before 1950, there was a huge virgin forest in Baixianglin. A lot of know-how related to the forest had been acquired by the villagers along with history. This kind of knowledge is always embedded in the local culture. The elder generation knew the specialty of trees and also the condition of the mountains and lands. HFC found the know-how from this kind of native wisdom that came down from generation to generation. Here, we afford some examples to demonstrate the exploitation and application of the indigenous knowledge.

Take the seed selections for example, sumac seeds are enclosed inside an oily shell, and the germination rate is very low. However, the local people knew that after burning or kneading the seeds in water, the germination rate can reach over 90%. Also, villagers knew that the germination rate of the seeds egested by birds is quiet high. The HAC members feed sumac seeds to the birds intentionally to promote the germination rate.

The experience on crops planting is also used in forestation. The villagers do not dig a hole for planting trees, but stack a heap of soil on the roots in order to avoid accumulation of rainwater which will canker the roots. They learned this technique from the experience of planting corn and peppers.

In addition, they applied the wisdom of life and nature to forestation. In their opinion, trees also

have relatives and friends. Therefore, do not burn the weed on the slope to plant trees, neither clean up large areas of weeds or shrubbery around trees. Trees can grow better if they are close to other trees, the same as people always live better in community. Thus, it is better to plant trees in large scale, rather than scattered. However, trees, as people, will suffer if they are too close. It is better to plant trees in a well-proportioned distribution.

The local people found a technique to plant trees on the stone according to the local proverb "Human being dance with Lusheng (Miao Bagpipe), trees dance with the wind." The knowledge embedded in this proverb means that trees can grow well as far as it can fix their roots. The local villagers say they are not afraid to plant trees on the big stones, as long as there is a crevice on the rock. The procedure to plant trees on the stone is simple. First stack soil on the crevice of the rocks and plant the saplings, then the roots of trees will insert into the crevices for water and nutrients.

HFC had three main approaches to share and transfer knowledge in the community: (1) Each group had regular discussion meetings. In the meetings, members were encouraged to openly express their ideas and opinions to each other. If one member found some effective approach, he/she always shared the experience with other members. If one member encounter with some difficulty, other members would try to help. (2) HFC always held training courses to transfer the knowledge to members. The instructors were experts from outside or local people who have some special skills. Around 3,500 people attended the training courses. (3) HFC sent the members to go outside to gather new knowledge. HFC sent 7 members to Fujian, Sichuan, Zunyi, Bijie and other places to study the practical technologies, such as edible fungus cultivation. Gradually, the members mastered advanced technology such as seedlings transplanting, pest prevention and green manure. Whether a local method or a foreign method, if it can work, it is a good method, as Yang Mingsheng always emphasized.

4.3 Irodori

4.3.1 Scenario description

1) General situation

Kamikatsu Chou is located deep in the mountains of Tokushima Prefecture, about 40 kilometers from Tokushima City. Forests occupy about 85 percent of the town's total area (109.68 square kilometers). It used to represent a typical depopulated rural town, where a population of 6,200 in 1955 has dropped to nearly 2,100 nowadays, 46% of which is over 65 years old.

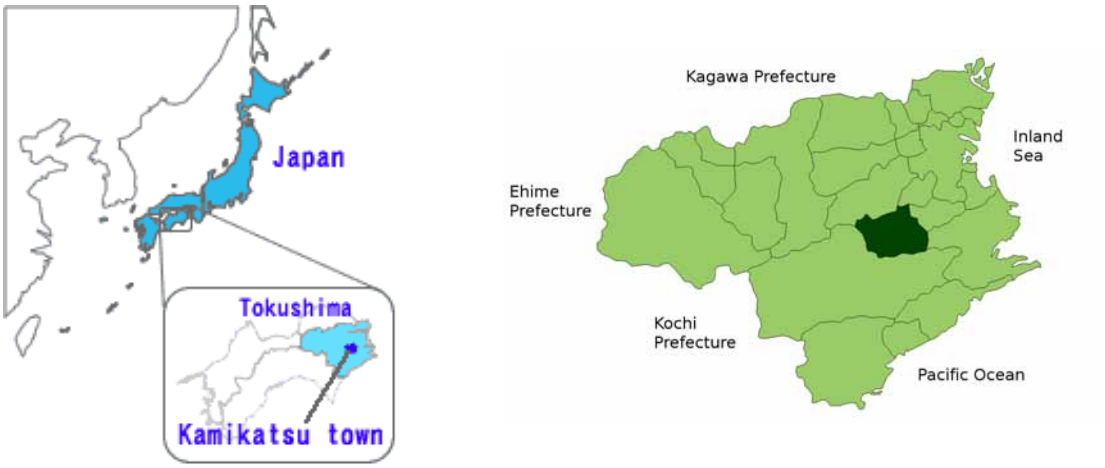


Fig 4-3 Location of Irodori, Kamikatsu chou

The main products of Kamikatsu used to be timber and satsuma (Onshu) oranges, but they had been pushed away by imported timber and oranges. In February 1981, a cold snap caused the death of most orange trees and devastated the town's economy. Under such circumstances, the town office, in cooperation with farmers and the agricultural cooperative, drew up a major plan to develop problem-solving abilities among citizens. Some new businesses started. Among them, especially, tsumamono commercialization of Irodori Project is remarkable nowadays. “Tsumamono” refers to decorative leaves and flowers which adorn plates of food at restaurants. Fig4-4 shows some examples of Irodori’s products and how they garnish Japanese dishes.

Fig 4-4 Products of Irodori: Tsumamono for Japanese dish

2) The origin and development of Irodori Project

The business was originated from a “flash” that happened to Mr. Yokoishi, the vice-president of Irodori company. When he was having meal in a sushi restaurant in Osaka in 1985, his attention was caught by two young female customers in a nearby table who were quite excited about the small colorful leaves served as artful garnish and started wrapping the leaves carefully with their handkerchiefs. Kamikatsu has beautiful tree leaves in abundance, whereas a wide variety of tree leaves and small flowers seems to be in demand among high-end Japanese restaurants as tsumamono for dish presentation throughout the year. In addition, unlike traditional agricultural activities, leaves can be easily handled by elderly population.

Mr. Yokoishi proposed the idea of Irodori Project and appealed for cooperation all over the town. Despite the great hardship and disputation in the beginning, Mr. Yokoishi and his entrepreneurship team accumulated the necessary know-how on product development, quality control, distribution and marketing, the number of participants gradually increased and the brand image of the Irodori Project began to take shape. The revenue increased to 50 million yen after five years and to 170 million yen after ten years. Today, Irodori Project consists of 190 members of independent farmers (mostly senior

females). The average age of Irodori members is 67 years old, the eldest member (female) is aged 92. In 2005, the total sales of Irodori amounted to 270 million yen, approximately 1.4 million yen per member. The great increase of sales has been accompanied with a constant increase in the number of products, from a few dozens of basic products initially to about 300 products in each season now.

3) Highly modern special platform for senior citizens

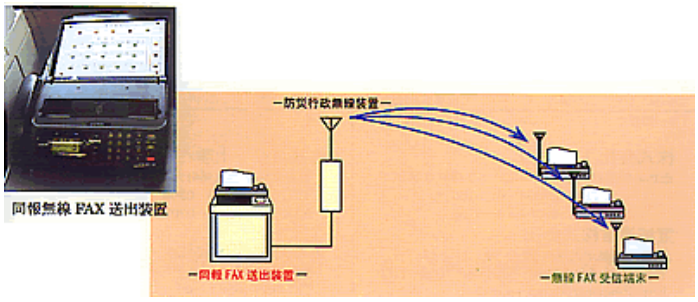
The operation of Irodori is supported by a highly modern and complex system of soft-and hard-infrastructure that has been developed gradually over last 20 years. In each season, Irodori provides about 300 different products to nearly 90 whole sellers located in major cities throughout Japan. The actual decision for what and how much of each product to be supplied each day is made by individual farmers (i.e., members) who cultivate trees and flowers on their land, while the total supply of each product is to be controlled by the Irodori Cooperative. Furthermore, farmers must make also longer-term decisions about what and how many trees and flowers to be grown on their land. Thus, each farmer needs a lot of the newest information (e.g., yesterday's prices) as well as long-term information (i.e., past trend and future projection). Such information is collected and processed by the Irodori Cooperative, and is provided for individual farmers through the computer system (in combination of a special fax-machine system) (See Fig 4-5(4) and (5)). Irodori Co. regularly provides seminars for all members to learn how to read and utilize the information in their daily business. The working flow is showed in Fig 4-5: (1) in the morning, after checking the information from Internet and fax, each farmer decides how much of each product will be supplied, and notifies the Cooperative of their decision. Farmers operate their computers using a special (simplified) keyboard and a big mouse, which were developed specifically for elderly people. (2) Then, they collect leaves, sprigs and flowers from the farmlands, after cleaning or tidy up, the products are packed for shipping. All the packages are collected at the Agricultural Cooperative of Kamikatsu before 4 PM. (3) All the products are transported to Tokushima airport and sent by airplanes to Tokyo and other distant cities by special

trucks, or they are sent directly to nearby cities by trucks. In this way, the entire operation of the Irodori Project is supported by the modern information-transportation infrastructure. In particular, the special computer system was developed in 1999 at the cost of about 300 million Yen (supported partly by the national government and partly by Kamikatsu-cho), boosting the sales value of Irodori Project by nearly 50%. It is also interesting to note that each evening, the ranking of all members in terms of sales value is announced through the computer system. Each day ends with a handwritten facsimile letter form Mr. Yokoishi, which summarizes in friendly and encouraging tone the results of the Irodori activity of that day, and his suggestions on next day's activity[164].

(1) Checking information

(2) Packing tsumamono

(3) sending to airport



(4) disaster-prevention fax system

(5) special keyboard and mouse

Fig 4-5 Information-Transportation System of Irodori

4) Great changes initiated by Irodori Project

Irodori Project, together with four other related initiatives in the town, has succeeded in turning the once hopeless town to a revitalized place, attracting about four thousand visitors in 2005 from other parts of Japan as well as from abroad, curious about its unique products. It initiated great changes in Kamikatsu Chou.

(1) Great changes in family financial status. Before the introduction of the Irodori Project, the local people depended solely on cultivating generic commodities, earning annually less than 0.2 million yen per farming household. Thus, in average, farmers participating in the project increased their annual income about ten times over the 20-year period.

(2) Empowerment for senior female. Most of the participants are aged women who were no more than helpers in traditional farming work, but now they can earn considerable cash income. This fact indicates the great contribution of the project to the empowerment of females in Kamikatsu.

(3) The realization of the social value and social participation of senior citizens. Kamikastu is called “the smiling town”. Needless to say their independent financial status, a more important point is that they can actively participate in society through their work. All the new productions are developed by individual farmers. The senior citizens can fulfill their wisdom and experience during the work.

(4) The improvement of the health situation of the senior citizens. It would be interesting to note that there are only two bedridden villagers to date among Kamikatsu’s elderly (65 years and above age group). Due to participation in the company, Irodori members are constantly stimulated mentally and physically, which sustains the well-being of the elderly.

In short, a young outsider (Mr. Yokoishi) together with local people succeeded in revitalizing the regional area through sustained efforts over 20 years, in which unique products (tsumamono items) have been constantly developed by utilizing creatively the seemingly ordinary resources (leaves, senior citizens, and land in deep mountains).

4.3.2 Analysis and discussion

The successful factors of Irodori are analyzed through three dimensions as follows:

1) Local leadership

Mr. Tomoji Yokoishi, an agricultural cooperative extension worker, spent nearly 20 years in working and communicating with the local people to gain their trust and friendship. During the beginning and

development of the Irodori Company, his attic faith and laborious spirit were the pivotal points of success. In 1986, Mr. Yokoishi together with some supporters initiated the Irodori Project as a town cooperative. In the beginning, the sale was only 1.2 million yen. Tsumamono is a very special good in limited market, because first, very few people have the precise knowledge how it is used in the decoration of the Japanese dish, second, it can not be deposited as the timely and right quantity is extremely important, the stale redundant good has no value; third, the consumer is very limited as for the unrelated people, tsumanomo is only valueless leaves. In order to gather consumption information from market, Mr. Yokoish spent all his salary in expensive Japanese restaurants in Tokushima, Osaka and Kyoto. Gradually, he mastered the knowledge of product development and marketing techniques, and quickly transferred the knowledge to the members to improve Irodori products. As the group accumulated the necessary know-how on market, product development, distribution access, the numbers of members increased and scale of Irodori began to take shape.

2) Re-conception of the local resources

The material for tsumamono is abundant in mountainous areas, and mainly light-weigh leaves can be easily handled by elderly people, and moreover, the elderly people, especially the elderly female, they always have more patience than young people to make this kind of elaborate tsumamono. Mr.Yokoishi exploited these two resources creatively. One point has to be emphasized, in Mr.Yokoishi's autobiographical book he thought without changing the women in the rural community, the rural areas can not be changed. In Japanese traditional rural culture, men have been the pivotal center of the community as they bear the financial resources of the family, community building and other major responsibilities. However, Mr.Yokoishi found that in real life, men are always just rhetoric critics without practical ability or intention; therefore, they have become the obstacles of the community organization. Mr.Yokoishi named this phenomenon "Yakugai". As a consequence, in the initiative stage of Irodori, he aimed to persuade the senior women to join. Fact has proved that his

thought was correct. While the men ridiculed or disdained him, it is the woman's diligence, carefulness, and adherence that contributed to the success of the business.

3) External technology application

Irodori project, though it is a business in the remote mountain area, its operation is supported by advanced information and computer system, logistical and transportation system. Based on this technological platform, all individual participants can attain the market information and business knowledge conveniently; they are well-connected to each other and also to rest of the world. Moreover, after they accumulate some income, the members are always organized to visit high-end Japanese restaurants in many cities, in order to experience by themselves how their products are actually used and what kinds of products are appreciated by the customers. Through learning by thinking, they can rethink about their products, leading to various innovations in their work.

4.4 Yaeyama case

In addition to small size, Yaeyama Islands also exhibit a combination of four other characteristics that may affect their economic performance: insularity, remoteness, being archipelagos and being highly mountainous entities. Even with the congenital handicap, Yaeyama Islands retained their own human resource; moreover attracted the outside people including younger generation. On the surface, their revitalization is originated from the development plan of government, the instruction of the basic infrastructure, the promotion of tourism industry and their charming natural resources. I have studied Yaeyama Islands since July 2007 by field survey. Abundant of local residents including the immigrations were interviewed informally or formally. Open-ended questionnaire surveys were conducted with tourists, government officials and entrepreneurs. A large variety of archival materials and information have been obtained from the bulletins of the government and local almanac.

4.4.1 Scenario description

1) General situation

As an archipelago in Okinawa Prefecture, Yaeyama is the remotest part of Japan from the main islands and contains both the most southern (Hateruma) and most western (Yonaguni) inhabited islands of Japan. It is far closer to Taiwan than to Okinawa Island (see Fig 4-6). The Yaeyama islands, with a total area of 228.91 Km², consist of 10 inhabited islands and 20 uninhabited islands. The 10 inhabited islands are: Hatoma, Hateruma, Ishigaki, Kohama, Kuro, Terama, Taketomi, Yonaguni, Yubu. 80% population concentrates on Ishigakijima, which is the centre of Yaeyama, also the second-largest island of theYaeyama Islands. Yaeyama, like the rest of Okinawa, takes cultural influences from both Japan and China due to its location between China and mainland Japan. While many other islands are suffering from depopulation and economy stagnation, the population of immigrant from the mainland to Yaeyama has increased rapidly since 2003: about 3,000 immigrants transfer their residents' cards

and the total number of the immigrations reaches 5,000 (April, 2005). The population transition of Yaeyama, Ishigakijima, Taketomi, and Yonaguni is presented in Figure 4-7. Moreover, the prosperity of the local industries can be observed during our investigation and interview with the local entrepreneurships and immigrations, not only the developing tourism industry but also revitalization of the traditional industries.

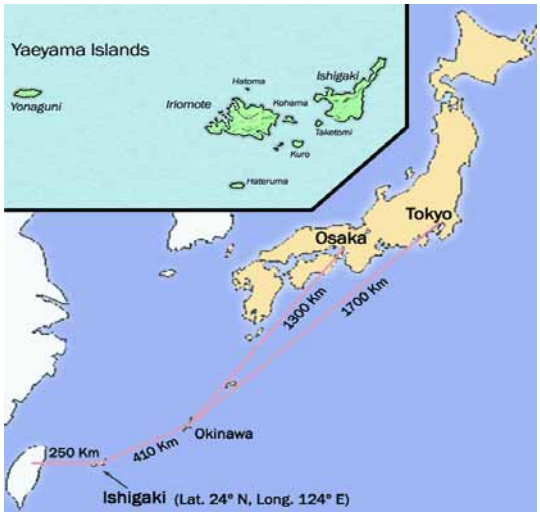


Fig 4-6 The location of Yaeyama

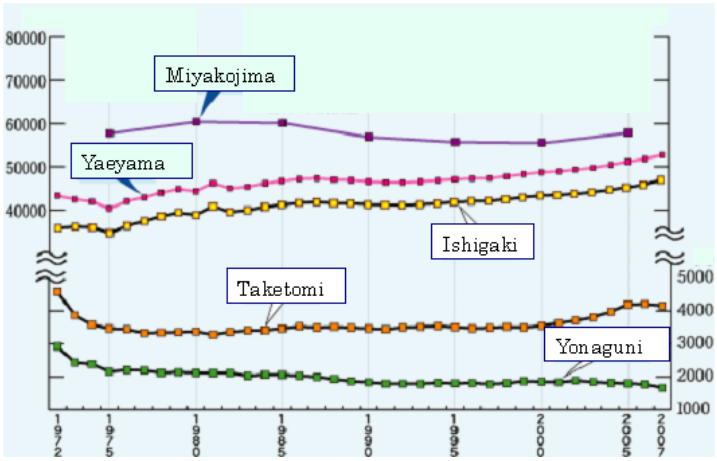


Fig 4-7 Population transition of Yaeyama[20]

Prior to Okinawa's restoration to Japan in 1972, agriculture was the only major economic activity in Yaeyama Islands. Up until the mid-1950s the dominant mode of agriculture was a self-sufficient one, mainly planting paddy rice and sweet potato, with millet and small-scale scattered sugarcane fields. After 1955, pineapples became a major cash crop and in the 1960s beef cattle became another major product. Currently, Yaeyama Islands have become a popular tourist destination and a "healing spot", where tourist's attention is attracted by their natural environment, rich cultural heritage and relaxed lifestyle. The number of visitors increased two-fold over the last decade largely as a result of the introduction of direct flights from metropolitan areas. In addition high-speed boats operate between

[20] Source: Yaeyama Daily Newspaper (2007-05-15)
http://www.y-mainichi.co.jp/?action_article_show=true&article_id=8120

Ishigakijima and other islands in Yaeyama and a great number of tourists board at Ishigaki port all year round. Tourist industry is now the main industry in Yaeyama Islands. According to the data from Statistical Department of Okinawa Prefecture, the aggregate income of Yaeyama Islands amounts to 108.877 Billion Yen (Ishigaki, 95.331 billion Yen, Taketomi, 9.149 billion Yen, Yonaguni, 4.417 billion Yen). The average income per capita of Yaeyama has won the first place in 11 consecutive years in Okinawa, amounting to 2.159 million Yen in 2004.

The natural resource and culture are the vitals for the island development, not only as the resource platform for tourism industry, but also the advantageous points for the agriculture industry. Maybe because of its insularity, and small size, islanders have an innate ability to work collaboratively. On the one hand, the shared resource, culture and mission connected all the islanders to form a community. On the other hand, they are endeavored to consolidate this community to keep the social cohesion. In such situation, the community which is based on the joint-mission to preserve the natural resource and traditional culture becomes the center of the residents' activities. Here, the case from Taketomi island and Iriomote island may afford some hints for rural development.

2) Taketomi Island

Taketomi has a population of approximately 360 (as of 2006) and an area of 5.42 Km^2. It is known for its traditional houses, stone walls, sandy streets and its traditional festivals, making it popular with tourists. Popular tourist activities include relaxing at the beach, snorkeling, taking an ox-cart ride through the village, and simply walking or biking around the island while enjoying the quaintness of the village and the natural scenery.

(1) Recognition of the local resource

Since the late 20 century, with increasing connections with the outside world, many scholars, visitors and immigrants have been attracted by the natural environment, traditional construction and culture. This makes the islanders realize how wonderful their culture is and should be proud of it. On

the other hand, many young men who went out to work and study in big cities came back to establish their business. The islanders care much about the island's heritage and future. A NPO Takidhun was established to research and preserve the fading culture and to protect the scenery and way of life of this unique island.

There are many famous festivals (Matsuri) in Taketomi Island yearly, such as Shichimatsuri, Tanadhui, Pui, Kitsugan. Tanadhui is the biggest festival, which takes place for ten days during September and October by the lunar calendar. All of the people who join the festival experience the soul-stirring passion and the sense of solidarity amongst the participants. As a result of islanders' efforts, Tanadhui Festival was designated as one of the important intangible cultural assets of Japan. "Yaeyama Minsah" was selected as a traditional craft product by the former Ministry of International Trade and Industry. Taketomi Island was selected as Important Traditional Constructions Preservation Area by Administration of Culture.

(2) Join vision formulation in Taketomi Transport Company

After World War II, for the purpose of material transportation, paid transport business began. 18 Taxi companies emerged successively. These companies operated individually and frequently combated with each other for customers, which in effect did harm to business development in this region. Such condition maintained even after an industrial cooperation established in the island. In 1993, Mr. Manabu Uema returned to his hometown from his work in other city and became the executive director of the cooperation. He made up his mind to persuade these taxi companies to join in the cooperation and to integrate all the businesses. He told them the significance of the integration to the island on the sustainability of their business and the future of the next generation. He said more than once, "We should try to establish a solid foundation for our children to make a career in the future. If you do not unite to realize a rational business system, all of your business should be lost and your children cannot stay in this small island. Don't you mind about such a miserable situation?" After 5

years' efforts, these companies changed their mind. Then, the cooperation transited to be Taketomi Transport Company. Currently, the business range of the company has extended to tourist industry delivery service and postal services. The company is planning to open up a supermarket because it is inconvenient and expensive for the islanders to do shopping in the island. The company has in practice the representative of the island's economy working for the welfare of the islanders. In fact, every business is taking place circling around the company, in other words, every islander is a member of the company. The company attaches great importance to the establishment of community.

- The company takes an active part in the activities of the Public Hall by assistance of drafting regulations and acts about environment protection and culture inheritance.
- The company requires every member to join in the island's collective activities, such as cleaning the street everyday, Tanadhui festival.
- The immigrants who refuse to accept the culture of the island or refuse to join in the activities of the community will be rejected by the company.

3) "Green Operation" -- Case of Iriomote Transport Group

Iriomote is the largest island in Yaeyama with an area of 289 Km^2 and a population of 2,400. Most of the island is covered by dense subtropical jungle and mangrove swamps. 80% of the island is protected state land and 34.3% of the island forms the Iriomote National Park. Iriomote is a coral island surrounded by many beautiful coral reefs. Until the end of World War II, Iriomote was largely uninhabited due to its infestation by malaria. After the war, the US Forces in Japan eradicated malaria from the island, and the island has been malaria free since. In the past, agriculture was the only industry; the cash crops were pineapple and sugarcane. According to the statistics, In Okinawa, sugarcane and pineapple have been the most important cash crops traditionally, accounting for more than 20% of all farm incomes and 50% of cultivated land. However, incomes from sugarcane and pineapple production have declined significantly since 80^{th} as a result of stagnant prices and

productivity as well as increased international competition. With liberalization of pineapple imports (1990), Okinawa's fruit was costing about two to three times the world market price. Its canneries shrank from 23 to 1 (1997). A 1995-6 study found pineapple plantations, which accounted for only 3 per cent of Okinawa's agriculture, responsible for over half of the soil run-off on the islands as a whole. Sugar cane was similarly problematic, with Okinawan sugar costing seven to eight times world market prices for raw sugar. Sugarcane farmers got a heavy subsidy from Tokyo to scratch along, and pineapple farmers nearly became impoverished without subsidy.

However, while the sugarcane industry is still using the subsidy from government, during the last ten years, the despairing pineapple found its vital force, the pineapple market (development entertainments and acted the tourist attracting in various places) was exploited, with cooperation with the souvenir shop and the restaurant, in Iriomote island. The kernel of this business platform is Iriomote Transport Group. The second generation Mr. Tamamori brothers organized this business group, the business group comprises 4 companies and 11 departments, with 180 employees. The group involves in multiple businesses of transportation and tourism, such as buses, taxies, sight-seeing boats, restaurants, supermarkets, spas, and so on. The yearly revenue amounts to 2 billion Yen. There was a rethinking that the farmer also voluntarily thought about sales, and it came to sell it for hundreds of yen/a piece as a souvenir (directly by post) for the tourist now. For the internet shopping, averagely, Iriomote pineapple is about 300 yen each one, more expensive than 30 years ago (25 yen). Also, pineapple juice can be bought in internet shop by direct distribution. In their advertisement, they emphasize on that the special climate condition and soil quality are best suitable for pineapple which is not only especially delicious, but also helpful for the skin and health.

4.4.2 Analysis and discussion

The distinctive feature for the islands is the resources limitation as it is insulated from the main market, unable to form scale of economy, in a word, and islands have many inherent disadvantages as

many other laggard places. However, Yaeyama Islands effectively exert the limited resources, including the people, natural resources and culture through the common community. Animate community and promising industry are emerging in Yaeyama islands. The illumination from the case of Yaeyama Islands could be analyzed as follow:

1) Community network based on joint mission

The islands are far from the main island with small population and relatively low fiscal capacity. In the past, the islanders were self-sufficient by doing farming. Even now, they live a simple and pastoral life. The islands are so small that people naturally know each other and have to help each other. The relationship between people and people is harmonious and friendly. All these engender close communication among people, which is easier for them to share knowledge and common values. On the other hand, grounded on the belief and worship towards the nature and gods, they created dances and festivals to offer to the nature and gods. They maintain a harmonious relationship with the nature. So, the community is somehow in a natural and simple way based on traditional culture knowledge obtained through empirical experience. Gradually, a shared vision and joint mission based on nature loving, heritage respecting and future concerning has become the intrinsic spirit of the community culture. In the case of Taketomi Transport Group, the quondam competitors could collaborate together because they shared the joint vision. In the case of Iriomote Transport Group, environment policies are announced and executed. Moreover, they pay full attention to convenience of the islanders' daily life, such as postal service, delivery service, bus service and supermarket in the future.

2) Re-conception of the local resource

The local natural or culture resource, such as climate, beach, decharge, sunshine, plants, traditional construction, street, festivals, lifestyle and even family food. Usually, local people are so familiar with them that people could not recognize how valuable they are. In Taketomi, islanders collaborate

together to protect their natural resources and traditions. In the whole Okinawa, its agricultural products are high value-added “Healthy foods”. “Okinawa” is becoming a brand name for “health and longevity” because of its world-renowned “healthy islands” image.

3) External spillover through local entrepreneurs

Geographically, the island is isolated from the main land, but mentally, it should be inter-collected with outside. Learning knowledge from outside is helpful for updating and amelioration for the regional culture. In this case, most of the entrepreneurs returned to the island to start the business after they learned knowledge from outside. They broad their views and activate their mind through learning outside. The social network and knowledge network have been enlarging through these returned people. They not only absorb knowledge, but also transfer and diffuse knowledge through their social network and knowledge network. Subsequently, they became the knowledge leaders of the community they belong to, and the community knowledge network enlarges synchronously.

4) Local leaders

Mr. Uema in the Taketomi is the key point of cooperation of this community. Their determination and enthusiasm moved other people. He is the builder of the join mission and propellant of community consolidation.

In this case, another implication is attained from the comparison of the sugarcane and pineapple industries: In the development process of the laggard area, the good intention of the local or center government is reasonable and understandable; however the moderation of the governmental participation should be paid great attention. Pineapple industry did not have subsidy from government as sugarcane industry. The comparatively low-profit but high-cost pineapple canneries were eliminated through fierce globalization competition. Local pineapple planting people were compelled to seek a way to save themselves to some extent. However, under the same severe globalization shock, some people recommended that sugar cane can be transformed from being merely cane for sugar into

the raw material for a range of industries, including fuel, distillation, fermentation, and fiber (high quality paper and cellulose), however, sugarcane planting industry reacted and resuscitated more slowly than pineapple industry. Maybe there are many reasons from the viewpoint of the whole marketing strategy while the direct subsidy support is presumed to be one of the main reasons. The tiny profit made the people be contented with the status quo and lose their motivation to change. It seems that the financial support from government snuffed out the vigor of the industry in the long term. The government should guide the local community, not just afford money or subsidy for the local industry, because it will snuff out the vigor of the industry in the long term.

Chapter 5 Discussion and Implication

Chapter 4 introduced four cases in Japan and China in detail, and their successful factors, including the external and internal factors are analyzed separately. In this chapter, the first and second section will discuss the determinant factors and mechanism of knowledge network based on the commonness of the four cases. The third section will go deep into the research issue by comparing the different aspects of the cases and aim to afford some empirical illuminations for the policy-maker.

Ahead of unfolding the discussion about knowledge network, the difference between knowledge network and catchword information network should be distinguished. Because of the tacitness characteristic of knowledge, one key point should be paid enough attention: knowledge>information. John Brown and Paul Duguid argue convincingly that knowledge is more than just information because it

- usually entails a knower;
- appears harder to detach than information;
- is something what we digest rather than merely hold[165].

A consequence of these observations is that attention to knowledge (rather than just to information) requires attention to people, including their tasks, motivation, and interests in collaboration. Knowledge is information that is attached to a particular context (for example, a task, problem, or question). Although information can be easily transmitted from place to place and person to person, the underlying context cannot. Information technology is necessary to realize the knowledge creation, integration, and dissemination, but technology alone is insufficient. Sharing and transferring tacit knowledge is a key point and dominant function of the knowledge network rather than the information network.

In addition, the heart of knowledge network performance is not the intelligent individual human

mind but groups of minds interacting with each other and with tools and artifacts. Social creativity grows out of the relationship between an individual and the world of his or her work, and out of the ties between an individual and other human beings. Knowledge network requires changing the attitudes to acknowledge the importance of the each participator in the community, the shared culture contexts, collaboration synergy of the community. The closely connected relationship in the rural areas which gradually disappears in urban areas is just the practice base of the knowledge network.

5.1 Determinant factors for rural knowledge network

Each rural area's ability to form the knowledge network dependents on local, natural, economic, social, cultural, and political elements which are supplementary or systemic as well as the ability to overcome barriers stemming from the organizational thinness and location disadvantages. Here, the factors which affect the rural knowledge network will be analyzed.

5.1.1 External (exogenous) factors

1) Governmental function

The installation of a local government system, however rudimentary, would be generally regarded as a sine qua non of rural development [166]. During the four cases, one point was observed that for the performance of the knowledge network, government could facilitate or impede the process of rural development in long term. However, in this research, the government does not especially point to one certain level of government. The level of government who master the powers and resources can be wholly or partially responsible for a considerate array of service and facilities that affect people's daily lives and livelihoods.

In Five Golden Flowers, the government, as the biggest player and initiator, who operates the project in macro and holistic point of view, regulating the statutes and condition, promoting the infrastructure and living environment, stimulating the external and internal investment, coordinating

the relationships among the communities, household families, external capitals and so on. As the direct actor and planner, Government plays a replaceable role in building the infrastructure, impelling the industry building, and stimulating the participation of the community.

In Baixianglin case, the forestation organized by government could not work at all, whereas, when the former governor changed to the local leader of the community, the government went backstage, and the unprecedented success achieved.

In the case of Yaeyama, by comparing the stagnation of sugarcane industry and gradual flourishing pineapple industry, the implication is that the direct subsidy from government maybe hedge people's gumption on the contrary.

During the investigation, some tragedies even happened due to the compelling intervention from government. Therefore, the proposition of this research is that regional governance structures must undergo a cultural and organizational shift away from traditional top-down bureaucratic structures towards more flexible and less rigid institutional forms that can respect and stimulate the self-reliance of the inhabitants. This requires a willingness on the part of government agencies to resort less to command and control forms of imperative order and rely more consensus building and inclusiveness in the policy process. Meanwhile, when the government affords support, only providing physical capital (money as subsidiary, R&D and technology infrastructure) may be not an effective way but should also deal with enhancing human capital (training of workers), social capital (i.e. encouraging the formation of trust based relationships between regional actors) which could enhance the inhabitants' autonomy. Policy formulation and implementation, then, is the result of intensive communication, close interaction and consensus building between all regional actors in policy networks. Policy makers are just one actor amongst others in these networks. Consequently, the key role governments play in rural development shifts from direct intervention towards stimulation, intermediation, brokering, promoting regional dialogue and building up social capital. In a word,

building the platform for business and promoting the service is the function government should put into practice.

In this context the UNDP's perspective on local governance may be informative:

Local governance comprises of a set of institutions, mechanisms and processes, through which citizens and their groups can articulate their interests and needs, mediate their differences and exercise their rights and obligations at the local level. It requires partnership between local governmental institutions, civil society organizations and private sector for participatory, transparent, accountable and equitable service delivery and local development. At the same time, it is concerned with strengthening of grass roots democracy and empowering citizens, communities and their organizations such as CBOs and NGOs to participate as equal partners in local governance and local development process[21]

2) External spillover

As mentioned above, due to the organizational thinness, knowledge generation/diffusion or application/exploitation subsystems are insufficient in the rural areas. However, external links provide access to ideas, knowledge and industry which are not generated within the limited context of the region.

In order to catch the external spillover, there are two traditional approaches. One is to attract industry from outside and, most important, to anchor them to the host areas, moreover, given the often weak endowment of rural regions with knowledge support organizations, in order to improve the regional knowledge infrastructure, branches of national research institutions or research centers, which match the needs of the regional economy, could be attracted, and if this level is impossible, at least, some technological experts should be employed to give instruction. The typical example is the industry recruitment, expert and artists introduction in Five Golden Flowers. The other is to encourage

21 www.undp/org.governance/local.htm (accessed 12/01/04).

local people to absorb knowledge from outside. The local people have to be supported actively to build up relationships with regional knowledge suppliers and transfer agencies, whereby it should be secured that knowledge is convenient and freedom to attain. The more important than fostering local ties seems to be linking local agents to knowledge sources (firms, research organizations) outside the region, i.e. to help them to “import” ideas and knowledge not available in the region. In this condition, the absorption capability of the local agents will determine the effectiveness of the external knowledge spillover operation.

5.1.2 Internal (endogenous) factors

Rural development is also concerned with the reconfiguration of rural resources. The land, labor, nature, eco-system, animals, plants, craftsmanship, network, market partners, and town-countryside relations, all have to be reshaped and recombined[167]. In the context of the modernization paradigm, these types of resources are seen as increasingly obsolete and external to agricultural production. However, from the success of these cases, it is therefore clear there is a need to help clarify how the knowledge network base are created, how the irrelevant is turned into a value and how, after combining with other resources, the newly emerging whole orientates to new needs, perspectives and interests.

1) Local resource

Local resource includes invisible and visible kinds of resource. The former always mentions about the natural resources, such as the beach, the mountain, the heritage building, the latter includes the local culture, ethical, religious values and so on. People in different parts of world live under different cultural and religious orders and derive various practical ethics from them. Some of these moral and religious principles are clearly more favored for economic development than others. Here, the analysis will focus on the visible resources; the intangible resources will be discussed in the local knowledge and join vision sections.

As severe as these cases used to be, the problems facing rural areas are said to range from the low-profit of farming, increased pressures on farmers to updating knowledge, to the lack of affordable infrastructures, and the creep of suburbanization, to concerns related to the out-migration of younger people and aging society problems in rural areas. Notwithstanding various disadvantages of the acid soil (FGF), barren rock-mountain (BXL), sunk island, isolated from the main market (Yaeyama), aging society (Kamikatsu), by applying new ways of thinking and doing based on the principles of sustainable development, the social, economic and environmental objectives and harnessed together and jointly met.

First, re-conceptualizing the rural resource as countryside capital[22] provides a more holistic and integrated understanding of the rural production system, which will be required if rural communities are to capture more effectively the potential benefits rural resource has to offer them. While the people are complaining there are nothing but only aging people, mountains and abandoned temple in the rural areas, if the thinking is changed in the perspective of countryside capital, the disadvantages in the common sense can be considered as essential components of the asset base of rural business. The aging people may have abundant experience, more patience than young people; mountains indicate beautiful nature scenery, clear air; abandoned temple even means the long historical culture heritage and so on. Maybe in the modernization paradigm, the key elements were an increased use of external inputs, recourse to the newest and often more expensive technologies, and the reconfiguration of the rural areas to accommodate them. However, the cases afford some proofs that the low-external-input economy approach which maybe also contribute to the environment sustainability, it has been proved to be a good starting point for the simultaneous development of other rural development practices.

[22] The definition of countryside capital adopted by the Countryside Agency in the UK is the “the fabric of the countryside, its villages and its market towns’ (Countryside Agency, 2003b, p. 45). Countryside Agency, 2003b. Rural economies: stepping stones to healthier futures. Countryside Agency, Cheltenham.

Rural development is not just about new things being added to established situations. It is about newly emerging and historically rooted realities that are reappearing in these rural development experiences. Rural development policies should pay attention on how to redevelop the existent local resources. A particular decisive element will be the combination of the “old” with the “new”.

Table 5-1 Re-conceptual of the rural resources as countryside capital

Mountains		Clear air, forestry resource
Sterile lands for grain		Landscape, suitable for other plants
Sunk island	⇒	Seascape
Abandoned temple		Historical heritage
Dialect		Special taste
Aging people		Much experience, patience

2) Leadership

The importance of leadership for community development, has received great attention both in the field of government and academy. Byrt defined leadership as “an imprecise, general, emotional, value laden term such as justice, democracy, sin and virtue” [168]. Therefore, leadership could be considered as a process, an outcome and as a collection of personal attributes. Corresponding, leaders were defined as persons who successfully attain desirable goals or possess a desirable collection of personality traits [169].

Concretely speaking, leader is considered as forceful and dynamic personality who really leads from the front, an architect and implementer of strategy, a mediator in conflict situations, an integrator who assures the climate of the organizations, a person able to motivate subordinates, and who, by persuasion , compulsion, or example to others, succeeds in getting others to follows the leader’s wishes. In the context of the local regional development, the community leadership was defined by Sorensen as the capacity of an individual or a small group to accelerate the pace of local growth by: developing a clear practical vision of the future that leads, inter alias, to a well reasoned and integrated set of goal; enlisting the strong long-term support of key community groups for the vision and its

related goals; motivating key actors in the community to deliver the strategy's main components-------infrastructure, investments, quality management and so on.

In cases two and three, we have to admit the development processes were mainly driven by the local leaders Mr. Yang mingsheng and Mr.Yokoishi. Undisputed, they are the prime movers in the local community. Their self-sacrifice activities, as one of the most prominent leadership behaviors, which is crucial in priming and mobilizing followers' voluntary participation in their own sacrifices, heightening followers' perceptions of charisma in their leader. They acquired the royalty and authority when they devoted themselves to the community interest in a disinterested manner and show a real concern for their followers' needs, rather than for their own self-interest. In case four, Mr. Tamamori and Mr Uema also played a positive role in promoting the connection of the community network. Mr. Uema spent five years in persuading the taxi drivers to collaborate together.

In these cases, the functions of the community leadership could be summarized in four aspects as follow:

(1) To formulate a realistic joint vision of the community's economic and social development

Leaders have to read the situation, in terms of what kind of knowledge assets are available to them. It is perhaps even more important to read the situation in terms of what kind of knowledge they are lacking, according to the knowledge vision that answers the question "Where are we going?" It is also important for the leaders to know where they can find the knowledge or personnel that will enable the community to create and exploit its knowledge.

With a high level of community acceptance and active commitment to the joint vision, leaders are always the spiritual prop of the community network.

(2) To organize the knowledge sharing and creation.

Leaders, as the builder of the knowledge network, should organize the knowledge creation activities among community. As Nonaka states, leaders should afford the "Ba" by providing

physical space such as meeting rooms, virtual space such as a computer network, or mental space such as common goals. As the Ba can be built intentionally, or created spontaneously, it is also important for leaders to discovery and utilize spontaneously formed Ba, which changes or disappears very quickly. Hence, leaders have to read the situation in terms of how members of the community are interacting with each other and with outside environments in order to quickly capture the naturally emerging Ba, then facilitate the connection and interactions amongst various Ba as the carrier of knowledge network.

(3) To motivate key community business-persons, administrators, and social activities to work systematically and in a coordinated way towards the vision.

(4) To lead by example. Leaders should be identified personally with a series of achievements that are consistent with their vision. Leaders usually are active practitioners in the process of knowledge transfer, knowledge creation and knowledge application.

3) Joint-vision

There are many terms about joint mission, such as corporate vision, common vision, and joint mission. A vision that permeates the organization can provide people with a needed sense of purpose that transcends everyday activities [170]. The overall vision is intended to generate a clear organizational purpose and prompt the necessary changes in the organization so that it can achieve its desired future goals. The vision can incorporate not only a vision statement that conveys a clear and unambiguous statement of the future and desired direction of the origination, but it can also incorporate a system of organization values. As a common faith in the organization, it provides a basis for a response to the problem of coordination, and it is a precondition for the members to co-ordinate their actions in the resolution of the organizational and technological problems which they confront with.

Through an articulated and communicated vision, it is important to engender a sense of involvement

and contribution among participators. Trust and openness are commonly cited as two of the components of the organization that encourage effective knowledge management process to occur. However the creation of the vision and set of the organizational values is not enough, they must be effectively communicated throughout the entire organization. Fostering love, care, trust and commitment amongst organizational members are important as it forms the foundation of knowledge creation.

For knowledge (especially tacit knowledge) to be shared and for the self-transcending process of knowledge creation to occur, there should be strong love, caring and trust amongst organization members. As information creates power, an individual might be motivated to monopolize it, hiding it even from his or her colleagues. However, as knowledge needs to be shared to be created and exploited, it is important for leaders to create an atmosphere in which organization members feel safe sharing their knowledge. It is also important for leaders to cultivate commitment amongst organization members to motivate the sharing and creation of knowledge, based on the knowledge vision.

To foster love, care, trust and commitment, knowledge producers need to be highly inspired and committed to their goal. They also need to be selfless and altruistic. They should not try to monopolize the knowledge created by the organization, or take credit for other members' achievements. Also, knowledge producers need to be positive thinkers. They should try to avoid having or expressing negative thoughts and feelings. Instead, they should have creative and positive thoughts, imagination, and the drive to act.

Closely related to the joint vision is the role played by a strong degree of civic-mindedness in the region. This civic culture and tradition identity is important for building a shared vision and goal for the region and in promoting the kind of networking and interaction that contributes to knowledge sharing and creation.

The “four civilizations” in Baixianglin represented local villagers’ strong wish of poverty alleviation.

"Natural preserve" in Taketomi island demonstrated to the world that the islanders' wish to cherish the culture and natural resource. In cases of FGF and Irodori, notwithstanding the absence of the articulated catchwords of the join vision, they do share one faith. In case of Yaeyama, this tradition is the product of decades of historical development, which may have been unplanned and uncoordinated, but worked to create the right environment for collaboration. In Baixianglin, it emerged from conscious efforts by the leaders to chart a new strategy for the region. In any case, the joint vision contributes to the growth of social capital[23] in the region that forms the bedrock on which individual hardworking, networking and interaction can occur in the name of further development[171].

One point should be pointed out that for rural areas, due to its small area and inherent close connection, the joint vision may be easier to be formulated than the urban areas. From this viewpoint, close relationship between the people is also one of the advantages of rural areas.

4）Local knowledge

Besides the faith, culture, tradition, intangible assets in the rural areas also includes local knowledge. Factually, it is very difficult to differentiate the local knowledge from local culture and tradition as most of the time, they overlap each other.

Local knowledge is also termed "traditional" or "local" knowledge. It is a body of knowledge indigenous people has accumulated over time, which allows them to live in balance with their environment. "Traditional knowledge (TK), indigenous knowledge (IK), traditional environmental knowledge (TEK) and local knowledge generally refer to the matured long-standing traditions and

[23] Social capital refers to various features of the social organization of a region, such as the presence of shared norms and values that facilitate coordination and cooperation among individuals, firms, and sectors for their mutual advantage. The existence of social capital depends upon the ability of people to associate with each other, and the extent to which their shared norms and values allow them to align their individual interests with the larger interests of the community. The networks that constitute social capital in this sense comprise a rich and dense social community in which the business relationships of the local economy are embedded. Social capital tends to be accumulated as an unintended consequence of other activities that people are engaged in; its presence or absence is linked to the vitality of civil society in that region [6, pp. 167-179; 7].

practices of certain regional, indigenous, or local communities. Traditional knowledge also encompasses the wisdom, knowledge, and teachings of these communities. In many cases, traditional knowledge has been orally passed for generations from person to person. Some forms of traditional knowledge are expressed through stories, legends, folklore, rituals, songs, and even laws. Other forms of traditional knowledge are often expressed through different means." "Traditional knowledge is not recognized as knowledge by all who study it since it includes beliefs, values and practices"[24].

Joseph Stiglitz divided knowledge into four kinds based on the explicit-tacit, local-general dimensions. Global public knowledge exemplifies knowledge that is general and explicit. General knowledge is knowledge that holds across countries, cultures and times; local knowledge takes account of the specifics of place, people, and time. The general versus local dimension and the codified versus tacit dimension can be used to generate a 2×2 table.

	Codified Knowledge	**Tacit Knowledge**
General Knowledge	Global public goods. Generally applicable and "downloadable," i.e., can be transferred by conventional vertical teaching methods--but "rediscovery" improves ownership.	General tacit knowledge (e.g., implicit grammatical rules of English) could be learned by horizontal methods (e.g., natural language learning) or might be (partly) codified and taught.
Local Knowledge	Localized explicit knowledge. Even if hypothetically available from center, should be locally "reinvented" to have ownership.	"The hard stuff." Combines horizontal learning and local reinvention.

Fig 5-1 Knowledge: General vs local and codified vs tacit dimension

source: from Stiglitz's research[26]

As the literature review mentioned, in the globalization era, because of the advanced development of the information and telecommunication technology, the competitiveness of the regions always relies on the local tacit knowledge, which seems like the ironical illogicality between globalization and localization. Meanwhile, the development strategies of the urban areas are not suitable for the rural areas because of some restrictions; on the contrary, special local knowledge is always deposited as part of the local culture during the long historical evolvement. Therefore, to develop and utilize the local

[24] Source: (Wikipedia, 2008)

knowledge should be more realistic and feasible for the rural development.

In Baixianglin case, the local people succeeded in afforesting on the barren rock mountains by developing the native wisdom that was deposited in the long historical culture, even living philosophy. The Facts show that the local knowledge is more effective that the experts' knowledge from outside sometimes because the people who live there generation by generation know the background, the resources conditions better than any others.

Long before the industrialization that took place in the twentieth century, communities were sustained through this sort of knowledge. Further, indigenous knowledge (e.g. about medicinal plants) is proved to be increasingly valuable intellectual capital.

Rural schools that support students learning about the local geology, biosphere, and heritage languages and cultures can play an important role in perpetuating traditional knowledge as well as creating new knowledge about how to live well in a particular setting----civically and environmentally. This kind of learning comes through local study in activities such as cultural journalism, biological, ecological, and geological studies of streams and other natural features of the landscape, or apprenticeships with local skilled craft persons.

5.1.3 Interaction of the external and internal factors

Due to the organizational and institutional thinness, both endogenous and exogenous determining factors should be combined according to the local situation effectively. In the cases, I found factually, in the formulation process of the rural knowledge network, the external and internal factors always interact with each other.

①②③ Government build infrastructure to improve the local condition, afford education and training, specially medium level skill provision to promote the absorption capacity of local agents and afford favored policy to attract external industry, knowledge; support/empower the local leaders. Just as Luke (1988) said, the role of government is "*leadership is critical not only as a catalyst in*

*promoting long-term economic growth, but to bring together the myriad key actors: business representatives, community and political leaders, and leaders from non-profit organizations, without active leadership in the public sector, even the best conceived economic policy or set of polices can eventually undermine the efficacy of a strategic long-term view***".**

④ Local conditions, including the natural resources, people, industry, knowledge, culture could be improved or damage by the external spillover. External spillover is always like a double-edged sword. Take the big scale supermarkets which enter into the rural areas for example, on one hand, they afford convenience for the local life, on the other hand, the local small shops may be pushed away by them.

⑤ Local leaders are always also the knowledge transfer.

⑥⑦⑨ Usually, It is leaders' role to articulate the joined vision and communicate it throughout (and outside) the community. The joint vision defines what kind of future the region should create, by asking such fundamental questions as "What do we have?", "What should we create?", "How can we do it?", "Why are we doing this?" and "Where are we going?" Since the vision is unbounded, unlimited, therefore, it is important for leaders to articulate the join vision based on the local resources, otherwise, it is a utopia. One point should be emphasized on that the local resource here means the re-conceptionized resource the advantages and potentials of which were fully recognized. This re-conception process is labeled as ⑧. The joint vision also enhances a common organizational identity among followers, invoking the shared stake in their future. As followers experience more motivational boosts and common identity with a vision, followers will try to interpret the sources and are likely to attribute the credit to the charismatic qualities of their leader, who initiated the vision.

However, the one size of "clothing" does not fit all societies; a "best practice" might work well in some cases but fail miserably when recommended in other contexts. A rural area learns to be a "tailor" partly by apprenticeship—it is hard to write down all know-how in one research, and even were it possible to do so, it may not be the most efficient way by which the local micro and macro conditions

can be different from each other—and a rural area should be its own "tailor" to find the best fit.

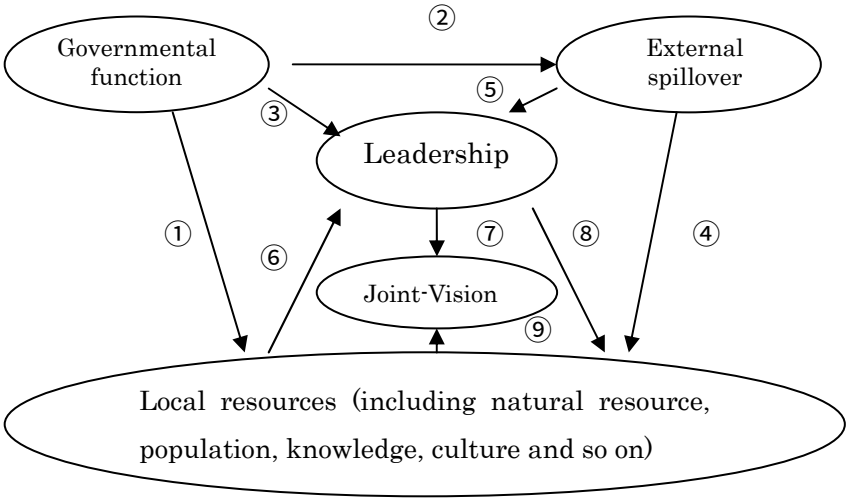


Fig 5-2 The interactive relations among external and internal factors

5.2 The mechanism for knowledge network

Comparing these four cases, maybe different factor plays the crucial role in their success. However, the similarity is: in the development process, they have been sharing some common basic strategy that re-identifies, cultivates and utilizes fully the local resources (including natural, historical, cultural and human resources, even elderly people), establish the autonomy of the individuals in the community, foster the joint vision to form the collaboration network to exert/create (existent/new) knowledge. Simply speaking, the three essential factors for the rural regional development are: autonomy, network and knowledge.

Next, the mechanism for knowledge network will be discussed in two levels, individual and organization level. For each agent in the knowledge network, autonomy should be its basic property because without autonomy, agent in the network might be like marionette not only in their "actions" but also in their opinions, views, and "knowledge"; agent will lack of self-confidence about the efficacy of their actions; a party might lack self confidence in their own intelligence, judgment, and other cognitive skills, let alone knowledge creation. In the organization level, the connection relation

and interaction effect will be the key points of discussion in this section.

5.2.1 Individual: autonomy establishment and enhancement

Autonomy has often been promoted as an essential, defining property of agent-hood, there is little further agreement about this concept. No universally accepted definition of autonomy exists, and proposed definitions vary widely. Autonomy is a concept found in moral, political, and bioethical philosophy. A formal definition of individual autonomy is necessary to provide a foundation for work in the area as well as to afford the establishment mechanism for individuals. According to Funk and Wagnalls dictionary: “Autonomous” is independent, self-governing while “Autonomy” is the condition or quality of being autonomous; esp., the power or right of self-government. Autonomy has generally been considered an attribute of groups, of organizations, of government. Autonomy is a desirable trait: the right to set your own agenda to conduct your own affairs with a minimum of outside interference.

Here, the concept of autonomy is extended to cover the conception of self-reliance or self-dependence. To be autonomous is not only self-determination, self-dependence, but also collaboration with others in the group and out the group. Therefore, to analyze the property of an autonomous agent should be unfolded from both the external (other agents or leaders in the community, related government, outside environment etc.) and internal (agent himself/herself) perspectives. The autonomous agent should (1) have his/her own vision, however, through the cases, I observed if the agents in the community could recognize the visions of each other, thereby achieving a joint vision which will work as catalyst for cohesiveness of the community, or else, probably the agent will be excluded from the group; (2) have the self-determination right to order agent’s affairs as he/she sets , with a minimum control from outside, but also have the ability to communicate and collaborate with others; outside, the business platform was built by government or local leaders, rather than substitute for agents’ discretionary right, (3) have a self-dependent capability to accomplish the target,

but also have the channel to attain support from outside if it is needed, such as financial, legal, technology, information support and so on. Most of the situation, the agents may be able to learn concrete know-how from the example of the leaders.

Table 5-2 The property of an autonomous agent

Range	Perspective	
	Oneself	External
Vision	Own vision	Joint vision
Plan	self-determination right	Platform
Practice	self-dependent capability	Support

In the knowledge network, autonomy increases the chances of finding valuable information and motivating organization members to create new knowledge. Not only does self-organization increase the commitment of individuals, but it can also be a source of unexpected knowledge. Agents should have ability to self-organize their own knowledge and practice networks to facilitate solutions to new or existing problems and to generate or share knowledge. By allowing the members of the organization to act autonomously, the organization may increase the chances of accessing and utilizing the knowledge held by its members. As Marengo pointed out, organizational structure matters, since it can be argued that relatively decentralized administrative structures, by giving greater decision making autonomy to agents, will enhance their capacity for exploring new knowledge and techniques[172].

A knowledge-creating organization with autonomy was depicted as an “antipoetic system”. Living organic systems are composed of various organs, which are made up of numerous cells. The relationship between system and organs, and between organ and cells, is neither dominant subordinate nor whole part. Each unit, like an autonomous cell, controls all of the changes occurring continuously within it, and each unit determines its boundary through self-reproduction. Similarly, autonomous individuals and groups in knowledge-creating organizations set their task boundaries for themselves in pursuit of the ultimate goal expressed by the organization.

Through the cases, I observed if the autonomy of the local people and communities has been established, it appears that they will have sufficient momentum to become self-sustaining. Certainly,

because of their different national economical background, each of them has its own specialty. However, the commonness is: for the local governments and local leaders, if they intervene too much, including negative (compel) and positive (support), the autonomy of the local regions will be broken or devitalized. Hence, the basic mechanism to establish autonomy is markedly similar. I illustrate it as follows:

(1) Respect the agent's own vision but also inspirit and reanimate the agents. As Schultz demonstrated that farmers in developing countries, with little or no education, are rational men who are unwilling to accept extremely risky and unproved improvements poorly fitted for their situations[173]. Policy makers should avoid making impractical blueprint or aggrieving agent's interest. Respect the individual's interest is the prerequisite of establishing their autonomy. If the expectation to the rural areas deviates from the practice, even confronts with the interest of the agents, it will cause serious negative effect, leading to impairment in the self-confidence, self-esteem, and self-efficacy of the agents. On the contrary, putting forward the joint vision which roots in the natural condition and culture history could be amplifying and sublimating individual perspectives to higher levels.

(2) Empower the self-management and self-determination right to agents; avoid the intervention into the production process, but also affording more business opportunities for agents. In FGF, the farmers have opportunities to rent their lands to companies, or make their own Happy Farmhouse, or Renzhong their lands. In Baixianglin, the members in HFC decide what they want to plant completely. In Irodori, the members decide what they want to produce and how much they produce.

(3) Trust agents but also help them to improve their capability. Agents are able to take charge of their own learning process and only the agents can find out their best practice in their own way. Therefore the policy maker should focus on fostering the learning and implementation capability of agents. In FGF, Baixianglin and Irodori, the technological trainings are afforded in various approaches to the farmers in order to improve their practical capability. As a result, FGF farmers got more know-how of

management the restaurant, flower industry; Baixianglin farmers got more knowledge of making profit with economic forests; Irodori farmers got used to the advanced IC system to promote the efficiency and the market demanding information to guide their production.

(4) The demonstration of the leaders will facilitate the autonomy establishment of the agents. In Baixianglin, until Yang mingsheng shifted from the governor to the practical leader in the community, the farmers could not be motivated. In Irodori, there was an episode, in 1996, Mr. Yokoishi shifted from the JA to Kamikatsu governmental office, and during the year he did not take charge of the Irodori business, the sale dropped so obviously that the Irodori members petitioned the government for Mr. Yokoishi's returning to manage the business of Irodori. That was the start-up of the Third Sector Cooperation.

The autonomous agents in the knowledge network are no longer passive receivers of knowledge but are active researchers, constructors, and communicators of knowledge. Knowledge is no longer handed down from above; it is constructed collaboratively in the contexts of work. Agents are active to absorb the knowledge from outside, and express the knowledge they master. That is the initiate step of the rural knowledge network. In Baixianglin, the local tacit knowledge of forestation in the barren rock mountains was collected from each agent. In Irodori, more than 300 hundred kinds of new products were created by the members. In FGF, a large number of farmer-entrepreneurs have been fostered.

5.2.2 The mechanism to intensify the community connection

As Tom Allen of Massachusetts Institute of Technology (MIT) found that engineers and scientists were roughly five times more likely to turn to a person for information than to an impersonal source such as a database or a file cabinet[174]. Let alone the farmers in the rural areas, relationships are critical approach for obtaining information, solving problems and learning how to do work. Improving efficiency and effectiveness in rural areas demands more than knowledge and technology

introduction—it requires social cohesiveness in the rural community. The success of these cases proved the close connection in the community could facilitate the knowledge creation and sharing in the rural areas. This interlaced relationship existing between individuals, groups, and organizations, as well as between collectives of organizations is always interpreted was the term “social network”.

Generally, the relationships evolving between actors can be categorized according to contents (e.g., products or services, information, emotions), form (e.g., duration and closeness of the relationship) and intensity (e.g., communication-frequency). Typically, network relationships are characterized by a multiple mixture concerning form and contents, i.e., the relationships between actors are of various forms, which may consist of diverse contents to be exchanged. The form and intensity of the relationships establishes the network structure.

In the rural areas, the relationship of the actors includes the formalized networks as one administrative village, town or county, as well as intensive connection, clan, consanguineous. Moreover, the culture interconnection on a long-term basis in the community usually plays an indispensable role in the long-term regional development. This connection is one of the prerequisites to decision-making processes in organization-wide actions. The relationships of network members can be understood as deriving from their autonomy and interdependence, the coexistence of cooperation and competition as well as reciprocity and stability. In rural areas, the reciprocity and interdependence are the dominant factor rather than competition due to their inherent closed connection.

The organizations of social network in these cases have their own characteristics. Generally speaking, FGF could be conceptualized as a hierarchy form organization from up (government) to middle (association) to bottom (farmer actors). The development policy was shaped and implemented typically from up to bottom. While The Irodori and Yaeyama cases are considered as flat decentralized network where all the agents coordinate and collaborate on the basis of their own wish and appointed agreement. Generally, the flat relationships demand more democracy and joint-mission. Whereas

hierarchy coordinates activities on the basis of instructions given to a limited number of organization members. Coordination occurs by contract and comprises discrete regulation as well as blurred interactions. Sometimes, it works because of compulsive action by the up and compromise from the bottom. The reasons conducing to these differences will be outlined in the comparative studying. Despite the different forms of organization, the cases provide some common implications as the mechanism to intensify the organization connection relation.

(1) The joint vision could intensify the connection of the social network. Because the social network embrace and cognize the culture which formed historically, the joint-mission has its culture and physical foundation. That is the advantage of the rural areas rather than the urban areas. The join vision could encourage people to share their knowledge and collaborate with each other. From this viewpoint, join vision is also an invisible “Ba” for the knowledge creation.

(2) Self-organization, as the physical carrier of the join vision will accelerate the consolidation of the community, such as the HFC in Baixianglin, Irodori Group in Kamikatsu, Restaurant Association in FGF. The membership gives people a sense of identity and belonging, which is regarded by many theorists as essential for the survival and psychological well-being of agents.

(3) There is another advantage for the rural areas to enhance the connection. That is the trust among people. Trust is one of those rare commodities that can neither be bought, nor imported and it is difficult to imitate or replicate; it can only be built up painstakingly through a prolonged process of interaction. Trust, as a component of social capital, helps overcome market failures or reduce the level of market costs for firms in densely related networks, by supporting stable and reciprocal exchange relationships among them. Building trust among actors in regional economy is a difficult process that requires a constant dialogue between the relevant parties so that interests and perceptions can be better brought into alignment. In an environment of mistrust, however, even the relatively minor changes in routines and procedures needed to accommodate incremental changes in knowledge may engender

considerable intra-organizational conflict.

(4) In order to promote knowledge sharing and transferring in the social network, a full-disclosure information platform is indispensible. This information system will afford all the members equal, flexible, and quick access to know where information is located, where knowledge is accumulated, and how information and knowledge can be accessed at a high speed. In Irodori, all the members can get the product information, marketing information through their internet. For the convenience of the elder people, Irodori introduced special unique computers for the members.

(5) The local leaders' self-sacrifice activities always work as the catalyst of the close connection of the social network. In Baixianglin, Yang mingsheng always considered villagers' interest first: he got the loan from bank with his own property as deposit and distribute to villagers; he afforded villagers his knowledge without reservation. In Irodori, during the 17 years working in JA, Mr. Yokoishi never gave money back to his own family. For collecting good and market information, he spent all his salary in the trip, Japanese high-level restaurant. He put on 20 Kilograms weight during the two years he always had to eat in the restaurant, also suffered from gouty because of the disorderly dietetic life. Moreover, in 2003, myocardial infarction accrued as a result of long-term overstrains.

5.2.3 Knowledge interaction in the community knowledge network

Emergence, which is the embryo of new knowledge, appears during the multi-level interaction processes: interaction between agents, between agent and organization (including the interaction between agent and leader), between agent and outside, between organization and outside, rather than by an individual operation alone. In SECI model, Ba is the context shared by those who interact with each other, and through such interactions, those who participate in Ba and the context of itself evolve through self-transcendence to create knowledge.

These cases are still in the very primitive stage of knowledge network as the scholars used to describe. Their activities may be mainly on absorbing external explicit knowledge to their own

business, or learning external tacit knowledge to promote their business management capability, or rediscovering the local knowledge to solve some special problem. Their knowledge creation maybe still depends on local leaders or some pioneers or some experts from outside. The processes may be still far away from the complete knowledge network which involves all autonomous agents who learn, share and create knowledge actively, where external and local, explicit and tacit knowledge interact with each other to produce sustaining innovation.

However, according to the information processing view, learning occurs in stages within a context of purposeful interaction by individuals seeking to understand, and trying to adjust to, fluctuations in their environment, or attempting to recover from misguided previous perception. Learning itself is an innovative process in which the organization creates and defines problems and then actively develops new knowledge to solve them. In these cases, at least, they are already initiating the learning process of establishing the knowledge network. Therefore, analyzing their primitive knowledge network will be heuristic for the future issue. The social networks between knowledge actors are the static platform for creation and transfer of knowledge on an individual, group, organization and inter hierarchical level. From the viewpoint of a dynamic interaction model, I will take into account the knowledge transformation and creation within Nonaka's four knowledge spiral process categories. The information and communication technology can have effects for the form and intensity of communication, cooperation and coordination within the knowledge network. The knowledge interaction emerged in these cases will be observed as follows.

1) Five Golden Flowers

In Five Golden Flowers, in the first stage "one village, one flower, one season", there were three main channels to absorb external knowledge and use local knowledge.

One is the joint venture company, the agricultural research institutions or outside companies were introduced to cooperate with local farmers to establish join venture companies. Farmers use their

farmlands as the share of the company and work as employees. Especially the joint venture company with the agricultural research centers, farmers could learn a lot of advanced agricultural knowledge as the centers aims to commercialize some of their research fruits by the company. Take one joint venture company for example: using the technology of Sichuan Agricultural Research Center, the agricultural technicians planted various kinds of exotic vegetables and fruits which attracted many customers to visit and taste. Inside of the vegetable garden, the land owner opened a Happy Farmhouse to host the visitors.

The second is the Happy Farmhouse. In order to promote the quality of the service, the local government always invited experts to hold training lecture for the farmers or visit their Happy Farmhouse to give advice face to face. Gradually, the local farmers have mastered the knowledge of the restaurant management.

The third is the Renzhong business. With the close connection and communication with the customers from outside, farmers attained more opportunities to learn knowledge from outside.

In the second stage now, “one village, one art” not only may be able to overcome the off-season disadvantage of the “one village, one flower” tourism, but also afford another knowledge transfer platform for the farmers. Till now, in FGF, the knowledge process mainly occurs in the combination and internalization of the explicit knowledge (See Fig 5-3). Next stage, the indigenous innovation, knowledge creation which emphasize on interaction of the knowledge and the local condition to creation new business model are expected.

2) Baixianglin

In the case of Baixianglin, there is also knowledge learning from outside: Yang Mingsheng and other pioneers went outside to learn the economic forest planting knowledge; Yang Mingsheng subscribed 18 kinds of agricultural and forestry journals for villagers to study. Moreover, experts are invited to teach agricultural technology. However, during the period of successful forestation, the local

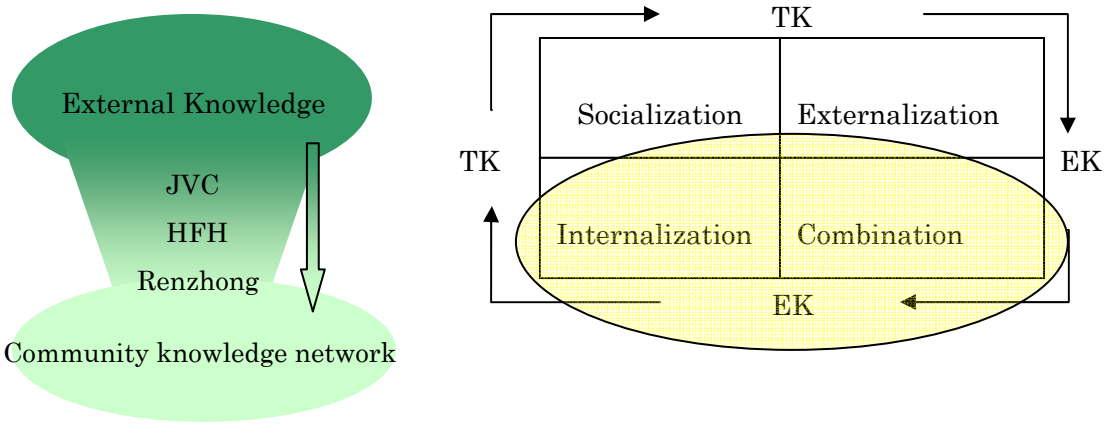


Fig 5-3 Knowledge flow process in Five Golden Flowers

knowledge played an important role. According to the appraisal of forestry experts, the ecological environment recovery would require 50 years and a huge economic investment. However, during the last 20 years, local people have succeeded in forestation by using the local knowledge. Because this kind of tacit knowledge was generated from the local wisdom and culture, it fits to the local situation natively, and also it is very hard for others to imitate. In Baixianglin, villagers were encouraged to express their tacit knowledge in the villagers meeting and symposium. Of course, they always shared their knowledge during the daily contact. The knowledge flow process is showed in Fig5-4.

This fluent knowledge flow in the network attributes to the joint vision of “four civilizations” in the community. As found in [41] if a network can create a shared identity among members, then that shared identity can lower the costs of sharing knowledge within the network[175]. In other words, Baixianglin’s network is effective at knowledge sharing, in part, because a strong network “identity” has emerged and the network has established rules (network norms) that support coordination, communication, and learning.

Next stage, broader knowledge learning from outside and interaction of the external knowledge and local resource are expected to promote the performance of the knowledge network.

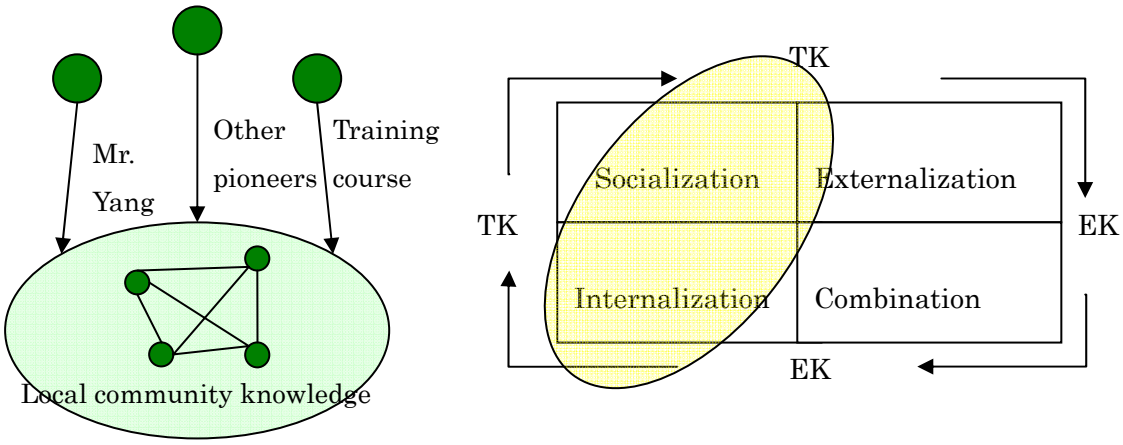


Fig 5-4 Knowledge flow process in Baixianglin

3) Irodori

Tsumamono is a very special commercial good. It will have no value unless the right quantity is sent to the right people at the right time. The market information and product requirement were embedded in the mind of chefs in top level Japanese style restaurants. As mentioned before, Mr. Yoishi made great endeavor to accumulate this kind of tacit knowledge. Then, he transferred the detailed know-how to the villagers, such as what kind of products is demanded in what time. In order to let the elder villagers have some perceptual cognition, the villagers were organized to have dinner in the restaurant to see how their products are used. Moreover, the advanced ICT knowledge was also introduced to promote the efficiency of the business. A lot of lectures were held to teach the elders to use the information system. The knowledge flow process of Irodori is showed in Fig 5-5.

Till now, the knowledge accumulation and creation mainly relied on the leader, next stage, more innovation activities are expected to be impelled forwardly by all the community members.

4) Yaeyama

Both in Taketomi and Iriomote Island case, the local entrepreneurs work as the knowledge disseminator of the community knowledge network. In the cases I studied, the current operators are the entrepreneurs of the second generation. They were born in the islands and have the education background or experience of working in other cities. The main reason is that the entrepreneurs of

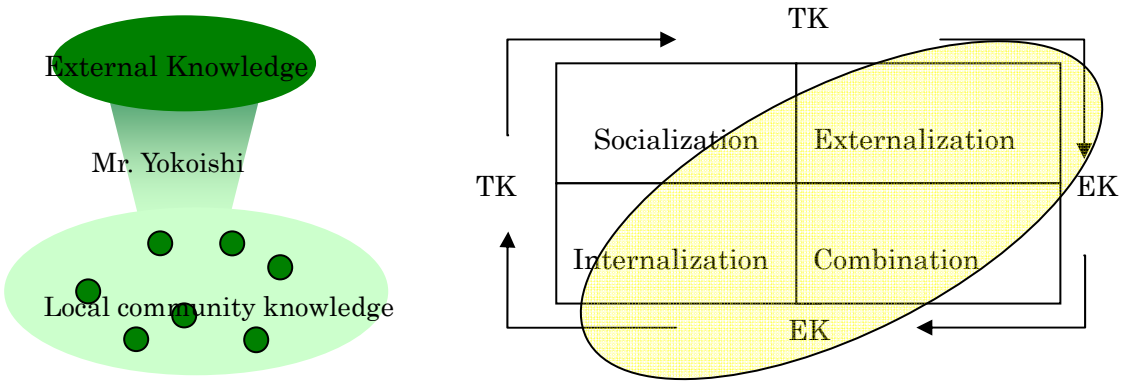


Fig 5-5 Knowledge flow process in Irodori

the first generation started up their own business and accumulated a sum of money. They hoped their children to learn more knowledge, to have more experience or to find a better career. So they sent their children to go to school or seek job outside the island. The current business is much bigger and more successful than the business run by entrepreneurs of the first generation. The businesses are integrated into modern companies, being managed in professional manner. The business range is extended and reengineered. This is, to a large extent, because the entrepreneurs of second generation have a larger social network and a wider knowledge network. On one hand, the entrepreneurs were born and grew up in the islands, so the tacit knowledge of the island community's common sense, culture and tradition must have exerted a subtle influence on their mind. On the other hand, the experience of school or job may leak knowledge spillovers to them either through formal education or from other sources. The knowledge local entrepreneurs obtained made it possible for them to identify the business opportunity and to manage their business effectively.

With the extension of their business range and the enhancement of their business experience, local entrepreneurs' social relations and knowledge communications are much more manifold. Gradually, their social network and knowledge network have been enlarging. They not only absorb knowledge, but also transfer and diffuse knowledge through their social network and knowledge network.

Subsequently, they became the knowledge leaders of the community they belong to, and the community knowledge network enlarges synchronously.

Inside the community, the islanders are connected with each other because of the join-vision. They share the knowledge with other each during the daily life. Furthermore, Islanders initiated innovation by applying collectively the local and external knowledge, such as the pineapple delivery business model. The knowledge flow process is showed in Fig 5-6. In the viewpoint of inside the community, Baixianglin and Yaeyama have the similarity.

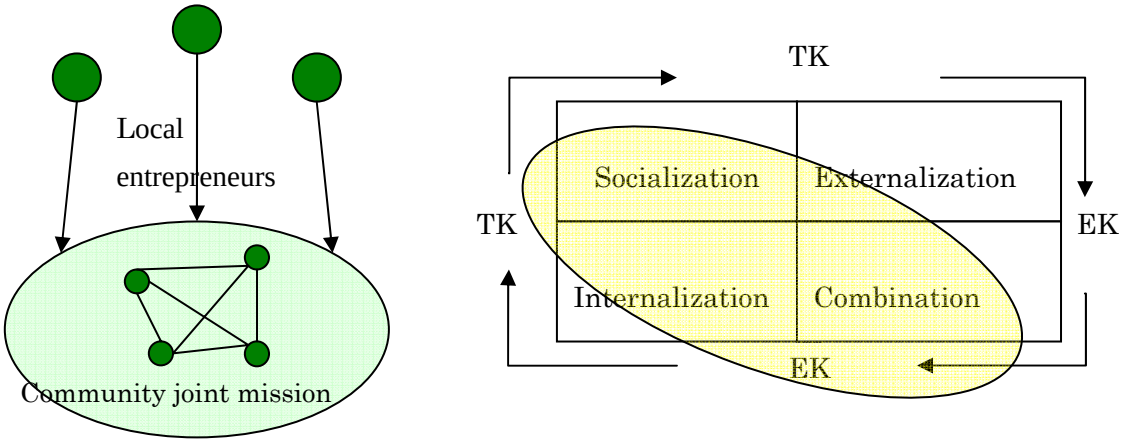


Fig 5-6 Knowledge flow process in Yaeyama

In a summary, as mentioned before, the knowledge networks in these rural areas are still in relatively primitive stage, therefore the processes of knowledge acquisition, absorption, creation and expansion still face to various barriers in each case, such as lack of the individual capability, deficiency of the external contact channels, insufficiency of the interaction platform or outmode ideology enchainment and so on. Broader activates of learning external knowledge, exploiting local knowledge, collaboration and more positive innovation are expected to promote the efficiency of the knowledge network.

5.3 The comparative analysis between China and Japan

As mentioned in the background introduction, the situations of rural areas are different in Japan and

China. However, from the perspective of the aging and urbanization rate, China (2010) will bear a close resemblance to the situation of Japan around 1972. In other words, China lags behind Japan about 30 years till now in the viewpoint of urbanization. In addition, the huge difference exists in the political system in two countries. Inevitably, the best practice for the rural development is different. The comparative analysis will deepen our understanding about the rural knowledge network mechanism, and afford various implications to policy makers. This research will avoid touching the issue of the land ownership. The comparative analysis will be expanded from four aspects, the dominant impetus, the contents of autonomy establishment, community organization structure and knowledge flow process.

5.3.1 Different prime mover

Though observing the four cases, the prime mover of the rural regional development in China and Japan is different. FGF, the government played the most important role in the development process, from the plan, implementation, financing, to maintenance, government invested huge money for the first step to build the road, give farmers subsidiary to rebuild the house, establish the pension and medical insurance for farmers. Baixianglin and Irodori, the local leaders are prominent individual, Yan mingsheng, Mr. Yokoishi are the essential key propellants. However, the identity of Yan mingsheng is still different from Mr.Yokoishi. The former was a governor in Baixianglin, and the special “leaving with paid” policy for him was benefited from strategy of alleviation poverty of the upper governmental which designated this area as an experimental pilot. The situation in Baixinglin can be considered as the government authorized Mr. Yang to take charge of the regional development project. Mr. Yokoishi also became one government officer but that happened after Irodori already expanded to quite big scale. From these cases, one tendency could be observed-------in Chinese rural areas, government still plays a dominant role in the process, while in Japan, the local leaders in the community play an important role (See Fig5-7). The reasons may be from follow aspects.

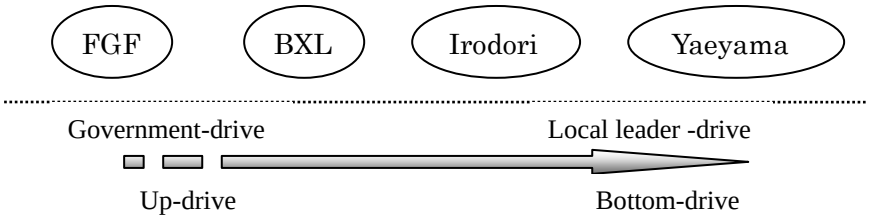


Fig 5-7 The prime mover of regional development in four cases

1) Community infrastructure VS governmental function

In China, generally speaking, as a developing country, although its economy has developed quite a lot during the last 20 years after reform policy, due to the scarcity of resources and the absence of strong and experienced private sector, rural areas are still short of infrastructure, such as the transportation roads, irrigation facilities, tap water, gas pipeline, sewage treatment equipment, social welfare system and so on, especially in the Western China. Government has the responsibility and maybe only government has the capability to afford these to the community. To some extent, only local government might be able to adopt the role of prime mover of the rural regional development. However, because China's current vertical bureaucratic system lacks a clear definition of governments' responsible purview and commitments in administration, which enables the governments to intervene into the rural industry development to an optional extent according to their practical interests and needs. Sometimes, the over intervention from the government power brought severe damage to the local industry development. However, an agreement has been achieved in the Chinese regional development academia that it is necessary for China to adopt a "government-led" strategy for her regional development.

2) Absence of local leaders

In China, due to the huge disparity between urban and rural areas, rural people always encourage their children to leave the countryside to live in the cities, the parents also would like to go to the city if there is opportunity, therefore, especially after the release control of the "Hukou", many middle aged

farmers also work as peasant workers in cities. In many rural areas, only elder and children left in the rural areas. The possibility of the appearance of the capable local leaders is very low.

5.3.2 Different contents of autonomy establishment

Generally speaking, in rural areas of China, the impediment factors for rural people' autonomy establishment are summarized as follow: their education level is comparatively low, they are short of knowledge and technology for the competitive agriculture; the social welfare and insurance system is not complete, their resistance for disease, natural disaster, market change is weak; the deficient democracy always caused encroachments of their self-determination right by the local governments, due to the absence or weakness of farmers' grassroots organization, farmers' rights safeguard channel is absent or exist in name only, farmers who encounter the unfair treatment always resort to some extreme behaviors.

In Japan, one obstruct of the autonomy establishment originated from the over protection of government. For example, in the agricultural industry, according to the investigation of OECD, 56% of the farmhouse's income comes from the subsidy of government. Norimoto pointed out, many local governors expect the local economy development on the investment and support from central government. Consequently, they spend most of their energy and time on getting money from departments of central government. The way to depend on outside gradually cultivate the indolence and apathy of the local area. As a consequence, the real problem in the backward areas is that the local actors are lack of a sense of crisis and urgency.

Under these conditions, the contents of autonomy establishment in the rural community are different in two countries. As in FGF, government focuses on infrastructure building, education training to improve farmers' competitiveness, social welfare system building and pushing the democratization progress. In Irodori, besides affording the business platform, Mr. Yokoishi also emphasized on how to exert farmers' consciousness, encourage elderly people's competitive sense. The rank of the sale is

exposed in their internet database.

Make a metaphor, the autonomy establishment in China, as cultivating a child's ability to live alone, education, demonstration, and support are necessary; in Japan, the autonomy establishment seems like how to make an adult who get used to be taken care of by other people to live alone, the keystone is how to motivate and encourage him to be self-discipline.

5.3.3 Different organization structure in the community network

As mentioned in 5.2.2, the joint vision could intensify the connection of individuals to form the community network. The collective synergy by joint vision based on the hometown love may release great power to promote the regional development. However, during the comparison of the four cases, the organization structure of the community network and consequently, the formulation of the join vision might be different case by case. Generally speaking, in Chinese cases, the organization structure could be conceptualized as a hierarchy form organization from up (government) to middle (association) to bottom (farmer actors). The development policy was shaped and implemented typically from up to bottom. The community networks in Japan might be considered as flat decentralized network where the agents coordinate and collaborate on the basis of their own wish and appointed agreement. However, as showed in Fig 5-8, this differentiation is not absolute between China and Japan. Some cases are more typical than others. In Chinese cases, the characteristic of the hierarchical organization of FGF is more obvious than Baixinglin.

Consequently, the formulation of the join vision is also different. In the hierarchical organization, the join vision is always put forwarded by the top and generated by top-bottom implantation. While in the flat organization, the joint vision may be embedded in the tradition and abstracted by the local leadership.

One main reason caused the difference in the rural community organization between Japan and China might be the limited empowerment of the local community. Responding to China’s deficient

democracy and strong government position, in rural China, the community members' commonly lack democratic awareness and insufficient abilities to participate in the planning process, thus, providing the villagers' committee the chance to overlook the public opinions and attitudes. For many rural areas, the deficiency in the community's existing democratic supervising system, as well as the overdependence on personal governance may also hinder its empowerment in the regional decision making process.

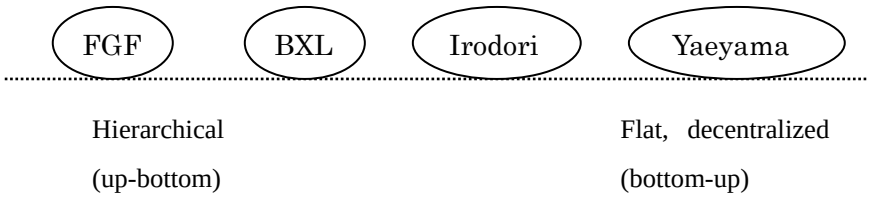


Fig 5-8 The community organization structure of four cases

5.3.4 Different knowledge flow process

The knowledge resource of the rural knowledge network has two main parts. One is the indigenous knowledge which embedded in the local culture, custom and wisdom as mentioned in 5.1.2, due to the complexity and tacitness of the indigenous knowledge, usually, it is difficult to exploit the indigenous knowledge by the agricultural extensionists or researchers from outside, unless they are able to engage in a meaningful dialogue and join in the practice with local people, and they must recognize the complexities of socially and politically differentiated nature of knowledge generation and transmission and explore methodologies that take this into account. In this section, the emphasis will be put on the other knowledge resource-----foreign knowledge through external spillover or active learning.

By comparison analysis, the differences in external knowledge flow-in and knowledge creation process were observed between Japanese cases and Chinese cases: in Chinese cases, the experts or research center always take the role of transferring external knowledge to the local community by the designation or requirement or invitation from government. Like in the FGF, the experts from the hotel

came to teach the farmers how to manager the HAPPY FARMHOUSE. In Japan, the local leaders, local entrepreneurs are always the knowledge transfers. They learned the knowledge from external, transfer and diffuse knowledge through their social network to the community. Subsequently, they became the knowledge leaders of the community they belong to, and the community knowledge network enlarges synchronously (See Fig 5-9).

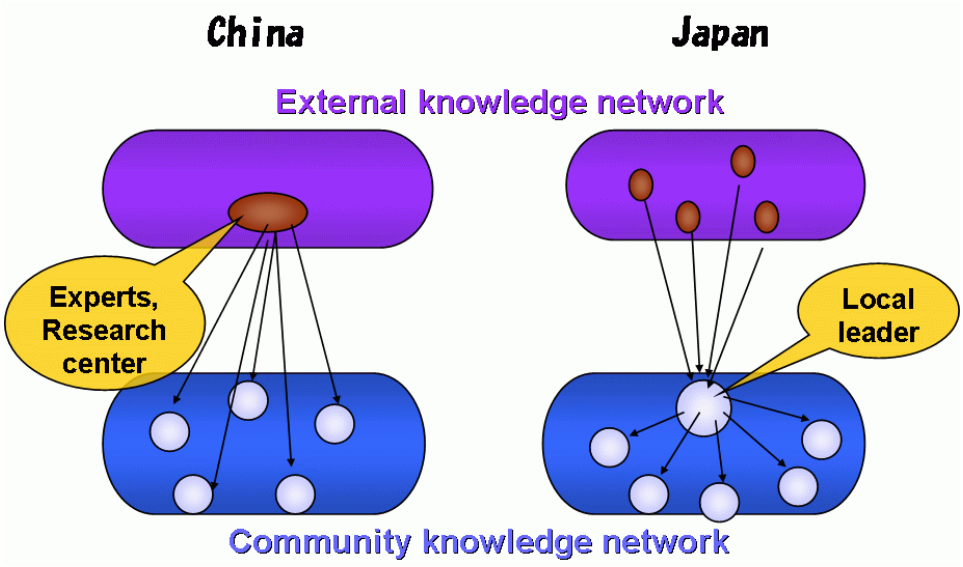


Fig 5-9 Different external Knowledge flow-in process

The knowledge flow and creation process of each case has already been introduced in detail in 5.2.3. As I mentioned before, all the cases are still in the primitive stage of knowledge network. Their activities may be mainly on absorbing external explicit knowledge to their own business, or learning external tacit knowledge to promote their business management capability, or rediscovering the local tacit knowledge to solve some special problem. The processes may be still far away from the complete knowledge network. However, more or less, they are involving in knowledge creation activities. The difference of these cases in the knowledge application and creation is observed: In Chinese case, the local communities focus on more on absorbing external explicit knowledge into solving the problem in the local industry. Like in FGF, they learned the knowledge from the agricultural research center to use

in their small flower company soon. In Japan, not only learning explicit knowledge actively, but also they begin to share tacit knowledge to create new products or industry.

5.4 Some new trends in China's rural development process

As mentioned in front, China's urbanization falls behind Japan about 30 years. Therefore, based on the comparative analysis between Japan and China, I dare to speculate some trends in China's future rural development besides the improvement of the basic infrastructure.

1) The reversion of community power

From the agrarian reform in the early 1950s, to the communalization movement after 1958, and at last to the new rural economic reform since 1980s the land ownership and the pattern of agricultural production in rural China have experienced several subversive transformations [176]. During the past century, the rural communities' traditional social and cultural structures, being characterized by small size, consanguinity and clanism, have been little changed. These characteristics make China's rural communities much stronger solidarities than any other kind of communities in present China, and enable them to speak with unity. On the other hand, as to the political setting, since 1980s, a democratic reform has begun in China's rural area, and rural communities generally have become self-governing entities through a mutual empowerment of state and peasantry grassroots [177]. A villagers' committee has been set up by grassroots election to take charge of the community's daily affairs, to shield the community "against the encroachments of the local governments and to protect their legal rights and properties". Since "the villagers' self-governance has changed the state's former pattern of countryside administration, in which rural communities had to accept the local authorities' direct governance" [178], authority of township, as the bottom of the whole national administrative system, has lost its right to make orders to the rural communities. Such an institutional change in the interrelations of governments and rural communities enables the communities to talk to government in

an equal position.

2) Emergence of the capable local leaders

Since the education reform in 1997, more and more people can get the education opportunities. At the same time, along with infrastructure building, social welfare improvement for habitants in rural areas, more and more capable people would like to engage in the agriculture industry, live in the countryside. They will bring back new agricultural technology, management knowledge and democracy consciousness. These people will become the local leaders. Local leaders maybe also spring from other backgrounds, such as some association, NPO organizations, or local government. In addition, the scarcity of local leadership in rural areas already caused great attention of the Chinese government. Chinese government has already implemented some policies to encourage the university graduates to serve as the “cunguan” (grassroots cadres in the rural communities) since 2005. The government aims to send at least one college graduates to each village. Though there are many historical, practical bottlenecks for the implementation of this policy, theoretically, it will be helpful to foster the local leaders in the long term.

Chapter 6 Conclusion and future study

"If farmers are rich, then the country will be prosperous. If villages are stable, then the society will also be stable." As Chinese president Hu Jintao said[25], to solve the "Sannong problem" is the top urgent task for the Chinese central government. To accomplish this objective, how to develop the rural regional economy causes wide attention. For Japan, to develop the backward area means how to fulfill the potential of the national economy, to reach a new upsurge of economical prosperity.

In the knowledge-based society nowadays, in the fierce competition of globalization, the local embedded knowledge and innovation are considered as the core-competence of the regions. Cluster, as the pre-condition of regional innovation system to promote the innovation capability of the regions catches scholars and policy-makers eyeball. However, cluster is not panacea. Due to the inherent geographic disadvantage and organizational thinness, the cluster could not formulate or need too long time and too big cost to be established. On the other hand, the advancement of ICT (information and communication technology) affords opportunity for the rural areas to attain knowledge from outside.

Therefore, during this new social revolution, take hold of the opportunity, adjust the strategy to form the knowledge network in the community is the urgent mission for the rural areas and also shortcut to decrease the disparity with urban areas.

This research described and analyzed four cases in China and Japan. Through comparing the experiences of four cases, this research examines the mechanism of knowledge network formation from the individual and organization level, including the establishment of individual's autonomy, consolidation of static and dynamic connection and enhancement of the interaction among of the agents in the organization. Moreover, this research attempts to understand the common as well as special characters of these cases to abstract a concept of rural development approach to inject vitality

[25] Source: TIME, 13 March 2006, 22

to stimulate the economic growth in rural regions. Some implications and illumination on the regional development issue were attained: Autonomy, human network and knowledge creation may be the universal factors for rural regional development. That means taking the local specialties into account, adopting the strategy and establishing the autonomy of the local people, form the collaboration network to exert/create (existent/new) knowledge should be a realistic and effective approach to develop the socio-economy of the regional areas and narrow the disparity between urban and rural. During this progress, the wisdom of the local leader or leader-team is essential, and it is indispensable for them to have an equal and open communication with the local community, their commonweal intention will motivate the members; The government should focus on building business platform for the local people, rather than compelling order or over protection, which will have a negative effect on local people's autonomy establishment. Collective synergy based on the hometown love could form the join vision in the community, which can release great power to promote the regional development. The joint vision may be embedded in the tradition or generated by top-bottom implantation.

Furthermore, the comparison between China and Japan was discussed in the aspects of prime mover, autonomy establishment implementation, community organization structure and knowledge flow process. The conclusion is because of the weak empowerment of community, the incomplete infrastructure system, social welfare system, absence of the local elite leaders, and the capability deficiency of the local people, the process of rural development in China is always government-driven while Japan might be community or local leaders are the main builder of the business platform. There is evidence to support the view that in less-developing areas where affording basic infrastructure is still government's current task, the community's implementation main tends to more reliant on the support from government, corresponding, making a living is still people's chief concern and the community's attention tends to be more towards economic benefits, rather than in the pursuits of joint-mission to protect the culture or environment.

While the direct and broad intervention of government may have negative effect on the autonomy establishment of the local community, in order to formulate and implement interventionist actions successfully, policy makers must possess a detailed knowledge about the local specificities and the factors undermining its dynamics, they should emphasize on providing platform, rather than bureaucratic order. For Japan, because the over-dependence on government impedes the autonomy establishment in rural areas, the government should also be focus on providing platform rather than afford financial support directly. A Chinese aphorism says, give a man a fish and you will feed him for a day, teach him how to fish and you will feed him for a lifetime. I think this old aphorism may have expressed the essence of autonomy establishment.

Using experience of Japan as reference, accompanying with the improvement of the infrastructure, social welfare system and reversion of community power, a large number of regional elites will emerge in China's rural areas and they will play a great role in organizing local people, activating the community, developing the regional economy.

This research is based on the key assumption that in the globalizing learning economy, knowledge network is a ubiquitous organization tool for regional development, but it would be misleading if knowledge network is regarded as standard ideal model for all regions. Undisputedly, there is no one set of policy instruments or a “one-size-fits-all” policy portfolio that suit all rural areas. Factually, one of our main arguments is that there is no one “best practice” knowledge network approach which could be applied to any rural region. However, this does not mean policy conclusions which are drawn from the analysis of these “success stories” can not be learnt from here. I believe that implications of this research have universality, which will be instructive to the rural development of other countries, either developed countries or developing countries, even the less-developed countries. Nevertheless, a call for more concrete combined to practical policy, dealing with specific knowledge creating and innovation barriers in specific regions, seems to be necessary.

A direct implication for future research is that the knowledge network perspective offers extremely useful insights not only in terms of theory, but also in terms of operation and empirically testing key relationship. This is neither to say that the research agenda of the regional knowledge network is in any way complete. Rather, a broad spectrum of research issues and questions remain open and virtually unexplored. Factually, in many rural areas, in the current stage, learning explicit from outside and then embodying in the local business may be already enough to improve a lot, as the first stage of FGF; or exploiting the local tacit knowledge may be enough to solve the problem, as the forestation stage of Baixianglin. This research regards these kinds of simple models as the rudiment stage of the rural knowledge network. The final objective of the rural network should focus more on the interaction activities of the local individual knowledge, local organization knowledge, and external knowledge to produce sustainable innovation, meanwhile, the knowledge network can be diagnosed to discover the handicap and shortcoming, so that, the advice to improve can be afforded to the related parts. The research presented in this thesis has established a useful starting point and raised several new questions that will require further investigation and analysis. Future research will be preceded from these aspects:

(1) The mechanism to promote the dynamic interaction of the social network in rural areas. Knowledge emerges from interaction of the individuals, interaction of individual and organization, interaction of explicit knowledge and tacit knowledge and etc.

(2) Due to data constraints, most of the research reported in this thesis is based on case study analyses. With the prevalence of new longitudinal panel data, we look forward to establishing a complete model of the rural knowledge network.

(3) The evaluation system of the performance of the knowledge network is highly intriguing research program. A complete evaluation index system is worthy to study, such as the sub-evaluation systems for the local leadership, government policy, out knowledge learning, local knowledge exploitation in

the knowledge network. It can be divided into result evaluation and process evaluation. Due to the complication of the output of knowledge network, the Fuzzy Comprehensive Evaluation (FCE) may be adaptive. The process of the knowledge flow will be divided into acquisition(including seeking and acquiring the external knowledge; capturing the internal knowledge), conversion (convert knowledge into useful form, including matching the external knowledge with the local practical situation; Combining or integrating external and internal knowledge to reduce redundancy, improve efficiency; organizing the knowledge to make it easier to distribute within the community), application (actual use of knowledge) and protection. In detail, use the Delphi method to get the weight of each evaluation factor from survey investigation of experts, and then use the Likert scales to get the evaluation concourses of each evaluation factor questionnaire investigation, at last, use the Fuzzy Comprehensive Evaluation to calculate the evaluation matrix.

(4) Deeper comparative studying of the rural development in Japan and China will also be another interesting topic.

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